July 1960

way TRACK and STRUCTURES

Long welded rails for new line

p. 32

A Simmons-Boardman TIME-SAVER Publication

SKELETONIZING

BALLAST CLEANING

KERSHAW TWO WHEEL KRIBBER IN TANDEM

WITH

KERSHAW

MACHINES

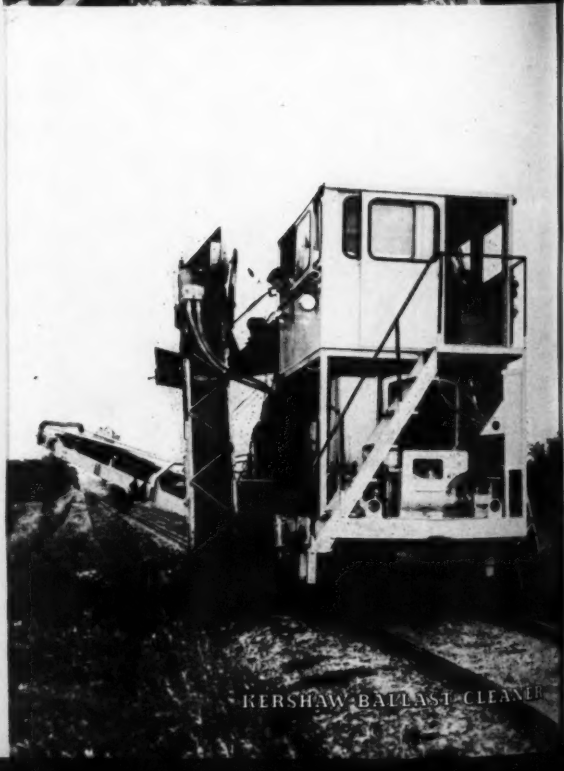
If skeletonizing or ballast cleaning is on your work schedule, do it with Kershaw machines guaranteed as to production and cost.

Here's how they work:
Two Kershaw Two-Wheel Kribbers, working in tandem, clean out all ballast from the center of the track and between the ties ouside the rail. The Kershaw Tie-Bed Cleaner, equipped with special feet, then removes the ballast from beneath the rails, even in cemented ballast conditions.

This leaves cleanly stripped track with the old, foul ballast neatly removed to the side of the shoulder. Then, if ballast cleaning is desired, the newly-redesigned Kershaw Ballast Cleaner picks up the old ballast and cleans it. The clean ballast is then placed on the ballast shoulder, or the center of the track, or the tie heads, or may be placed and distributed uniformly ahead of your surfacing operation.

All this guaranteed to meet your requirements as to quality and production.

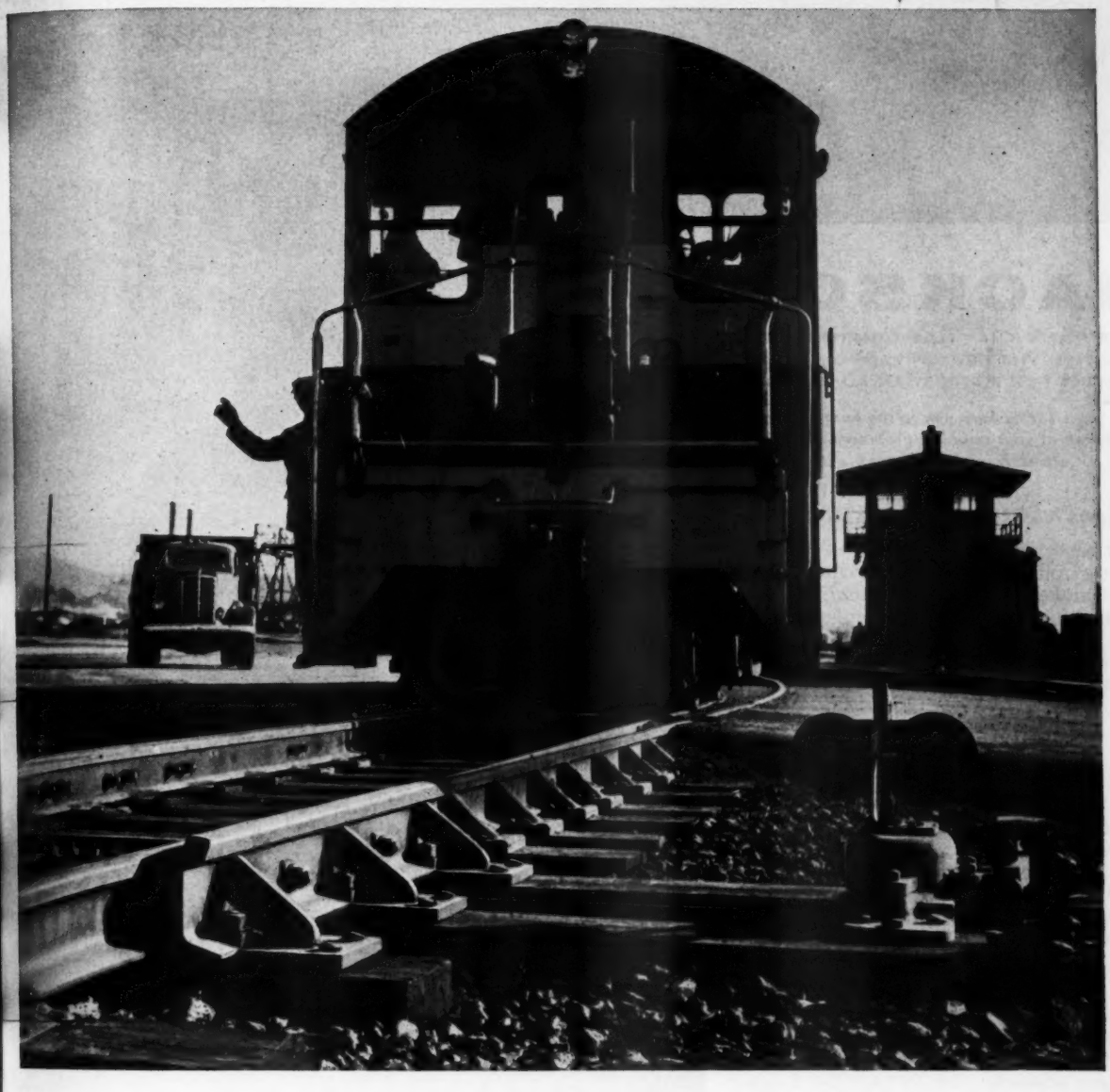
KERSHAW TIE BED CLEANER



KERSHAW BALLAST CLEANER

KERSHAW MANUFACTURING CO. INC

MONTGOMERY ALABAMA



Bethlehem Switch-Point Guard Rail increases service life of points and stock rails

This rugged, 4 ft 9 in. length of heat-treated rail can make a world of difference in the service life of your valuable switch points and stock rails. It is Bethlehem's Switch-Point Guard Rail, designed specifically to prevent cutting, rail-climbing, and derailments in yard operations.

As you can see, the head of the guard stands higher than that of the stock rail. As wheels enter the switch, they are eased away from the point so they can't do any damage. The ends of the guard rail are beveled to soften the shock to car and lading. The Switch-Point Guard Rail is reversible so that you can use it on either side of the track.

The best way to appreciate this faithful watchdog is to see it in action. A Bethlehem engineer will be glad to arrange a demonstration for you. He can be reached through our nearest sales office.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

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BETHLEHEM STEEL

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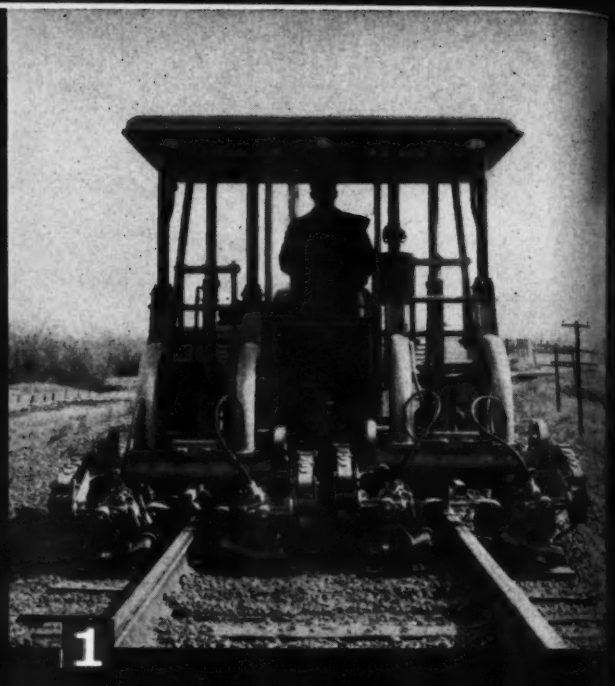
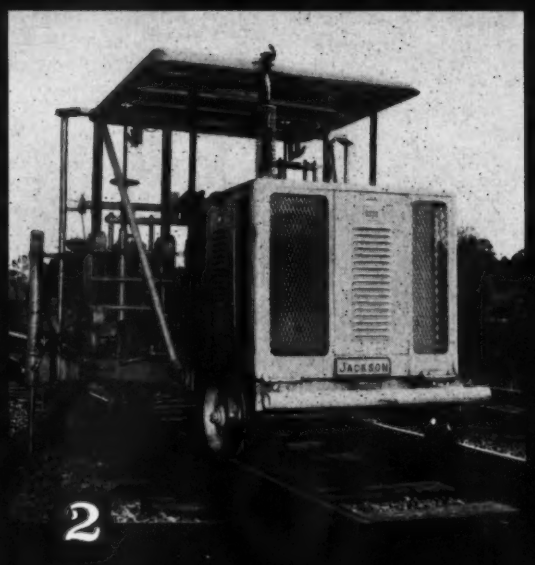
Let us help you to the best solution of your tamping problems. We offer attractive acquirement plans.



1 JACKSON TRACK MAINTAINER

The superiority of this machine over all others in its category is so obvious to all who make a thorough comparison that once you do so, we are confident you will buy no other. Write, wire or phone for complete details or nearest location where you can see it in action.



2 JACKSON JACK-SPOT

. . . an exceptionally advantageous, triple-purpose machine. It's TOPS FOR JACK TAMPING, PERFECT FOR SPOTTING and SMOOTHING, AN EXCELLENT PRODUCTION TAMPER for moderate to high raises. ENTIRELY PUSH-BUTTON CONTROLLED and OUTSTANDINGLY SAFE. Let us supply complete details.

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A complete tamping machine ideal for spotting and smoothing, secondary programs and all yard track maintenance. Utilizes powerful "MAINTAINER" tamping units. Traveling, indexing and workhead are all hydraulically controlled. Excellent for those secondary programs which do not justify the investment in a dual track tamping machine. It will pay you to get the facts.

R05

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Railway TRACK and STRUCTURES

JULY 1960 • Vol. 56, No. 7

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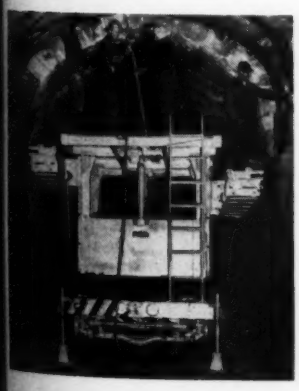

Cuts down tunnel floor to get more clearance 23
Describes the procedures used by the Milwaukee to excavate the floor of a single-track tunnel so that restrictive clearances could be eliminated.

Wabash tests explosive hardening 26
Manganese trackwork that has been repaired by welding is being work-hardened on this road using the sheet-explosive technique.

What's need for short, long-range programming 28
Summarizes what was said on this timely subject by three chief engineers at a two-day seminar meeting of the RSPA at Chicago last month.

CTC—Its effect on M/W work 31
Gives the answers to four questions relating to this subject. Based on an address by C. E. R. Haight, chief engineer, Delaware & Hudson.

Build 37-mile line with 1000-ft rails 32
Tells how long rails were laid by using tractors to pull them off the cars onto roller assemblies placed on the ties.

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◀ Don't miss . . .

Suddenly tunnels are in the spotlight. Higher loads are requiring that they be enlarged or eliminated. The linings of many older tunnels are in need of repairs. A special report will tell what's being done—and how.

. . . in the August issue

MODEL X-61-E

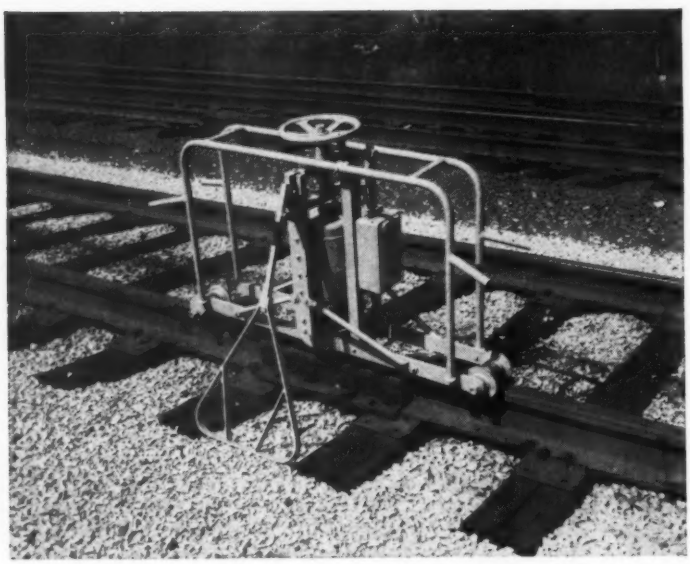
Portable Electric Cross Grinder or Slotter

Designed for use with welding generator sets. This model is easily maneuverable. Entire unit weighs only 195 pounds, rolls over and off the track quickly and easily as the operator takes hold of the protective cage. Ruggedly constructed to insure precision operation with little vibration, over a long service life.

Standard equipment includes 1½ hp, 220/440 heavy-duty motor and starter box. 8″ d., ⅝″ grinding wheels available in various thicknesses. Overall dimensions: Height: 24″ Width: 21″ (along axis of truck as mounted for operation). Length: 33″ (exclusive of outrigger).

One man operates RTW Track Grinders . . . easily!

One man can mount, move and operate either of these two portable, heavy-duty RTW Track Grinders. Balanced design makes them light in weight, easy to handle, frees men for other work. Write or phone us for more information on how precision track grinding can be done at low operating cost.



MODEL P-62-E

Portable Electric Rail End or Surface Grinder

Simple balanced design keeps maintenance to a minimum, reduces operating costs and operator fatigue. Standard equipment includes a rugged, all-weather 5 hp electric motor and starter box and one 8″ x 2″ cup grinding wheel.

Overall dimensions—Height: 25½″

Width: 14½″ Length: 58″

Total weight only 275 pounds.

TRACK MAINTENANCE MACHINERY

Switch Grinders • Cross Grinders • Surface Grinders • Rail Drills
Cross Cutters • Track Liners • Bit Sharpeners • Tie Nippers
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Speed Yard Operations at Less Cost with Racor® No. 22 Stand!

The word has been passed in a number of yards: ladders and other areas equipped with Racor No. 22 Switch Stands may be run through. Result: time and money saved by eliminating costly switcher stops and delays.

This husky switch stand will take any number of run-throughs and automatically complete the throw and the proper indication. The hand lever stays where it was.

Even in yards that will not permit switch trailing, the No. 22 stand will save money by eliminating the costs of accidentally damaged switches, rerailing, operating delays, locomotive repairs.

The Racor No. 22 Switch Stand makes switch point adjustment easy, too. Every stand is equipped with a heat treated, forged steel, adjustable crank eye that is actually stronger than rigid types. Accurate adjustments can be made without respiking stand.

If you are interested in speeding up your operations and saving money with this heavy-duty stand, let your Brake Shoe representative know.

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Quality products cut your ton-mile costs!

A-7961

DECK JACK permits operator to lift one side of deck when renewing stringers, 21" stroke.

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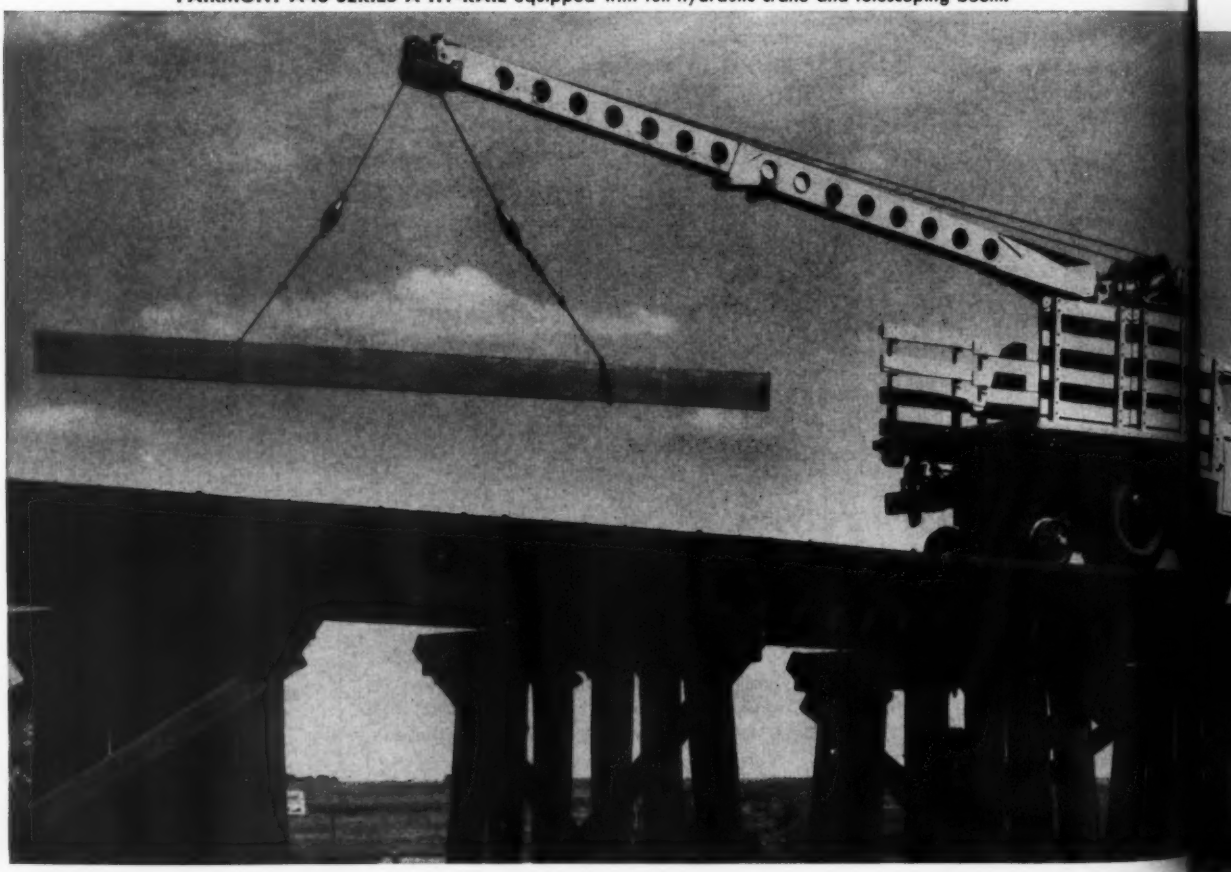
Hydraulic power speeds maintenance work

From a heavy-duty repair job on a trestle with mobile crane and boom . . . to an everyday, in-the-shop repair job with power drill, you'll get greater efficiency, safety, and strength with Fairmont hydraulically operated power tools and equipment.

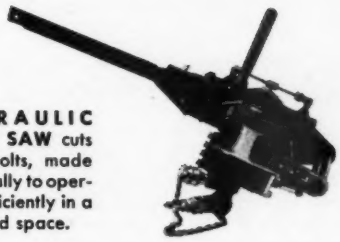
Hydraulic power insures accurate control at all times. Both the tools operated by power cylinders, such as the bolt cutter or jacks . . . and the tools operated by a compact hydraulic motor, such as the impact wrench or chain saws, are easier to operate and safer as a result of accurately controlled hydraulic power. In addition, the motorized hand tools are light in weight, free of fumes, and quiet in operation.

Several sizes of compact and portable power units furnish hydraulic power for Fairmont's complete line of tools: jacks, bolt pullers, bolt cutters, drills, chain saws, hack saws, impact wrenches, deck liners, and brace pullers. For full information on any or all of Fairmont's hydraulically operated tools and equipment, write or give us a call today.

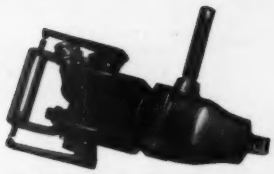
FAIRMONT A40 SERIES A HY-RAIL equipped with full hydraulic crane and telescoping boom.



HYDRAULIC BOLT PULLER pulls drift bolts in open deck trestles easily, 24″ stroke.

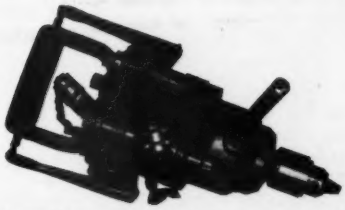


HYDRAULIC HACK SAW cuts drift bolts, made especially to operate efficiently in a confined space.

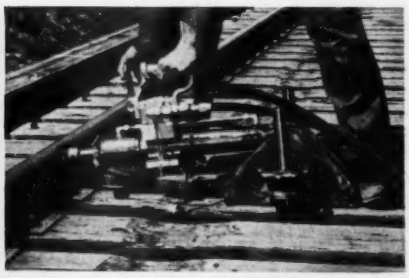


HYDRAULIC IMPACT WRENCH is reversible for tightening or loosening nuts.

HYDRAULIC CHAIN SAW works under water without modification, 20″ and 30″ models available.



HYDRAULIC DRILL can power a complete range of bit sizes, up to 1″ bit in wood.

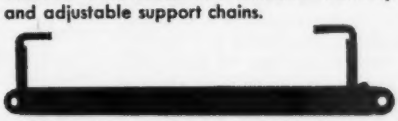


HYDRAULIC DECK LINER AND BRACE PULLER. As a deck liner (right) it is used on open deck trestles to shift ties and rails. As a brace puller (left) piston rod pushes against head of bolt, and brace is pulled up against pile.

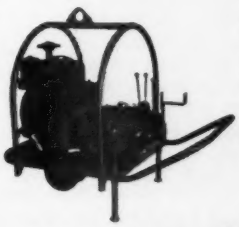
HYDRAULIC JACK clamps onto pile and pushes against jack beam or cap, 21 ton capacity.

HYDRAULIC BOLT CUTTER can shear mild steel bolts up to ⅞″ diameter.

BRIDGE SCAFFOLD has anti-skid walkway and adjustable support chains.

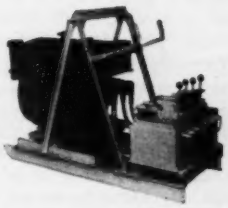


JACK BEAM is placed below stringers, jacks push against it when renewing caps.



W98 POWER UNIT includes one pump and three control valves, delivers oil at two different pressures, works one tool at a time.

W108 POWER UNIT is portable, compact and features a variable output between 3 and 7 GPM to conform to hydraulic tool requirements.



W103 MULTIPLE PUMP POWER UNIT is equipped with four pumps and control valves, can operate four different tools at the same time.

FAIRMONT RAILWAY MOTORS, INCORPORATED
FAIRMONT, MINNESOTA

NEWS ABOUT PEOPLE

BALTIMORE & OHIO—John H. Lindsay, division engineer at Baltimore, Md., has retired recently after 44 years of service.

CENTRAL OF GEORGIA—J. S. Pritchett, assistant supervisor bridges and buildings at Columbus, Ga., has been promoted to supervisor bridges and buildings at Macon, Ga.

DENVER & RIO GRANDE WESTERN—K. L. Rathgeber, assistant engineer at Denver, Colo., has been promoted to location engineer. **W. J. Gill,** roadmaster at Salt Lake City, Utah, has been transferred to Denver and **J. L. Hodgkinson,** roadmaster at Denver, has been transferred to Salt Lake City.

ELGIN, JOLIET & EASTERN—William R. Carter has been appointed assistant supervisor work equipment at Gary, Ind., succeeding **Bernard F. Riegel** whose promotion to supervisor track was announced in the May issue. **Matthew Mihalick** has been appointed assistant supervisor track-system at Joliet, Ill., succeeding **Donald C. Morgan,** resigned. **Donald L. Vercelote,** junior engineer, has been promoted to senior engineer at Joliet, succeeding **James P. Roberts,** resigned.

ERIE—Harry J. Weccheider, engineer maintenance of way at Youngstown, Ohio, has retired after 45 years of service.

FRISCO—F. L. Richardson, Jr., has been appointed assistant general foreman, bridges and buildings and water service, at Tulsa, Okla.

ILLINOIS CENTRAL—Herbert F. Longhelt, division engineer at Waterloo, Iowa, has been transferred to Memphis, Tenn., succeeding **Henry F. Davenport** who has been promoted to the newly created position of staff engineer, with headquarters at Chicago.

MILWAUKEE—C. H. Tusler, principal assistant engineer at Tacoma, Wash., has retired, effective June 30, after 38 years of service.

NEW YORK CENTRAL—John E. Egan, Jr., supervisor track at New York, has been promoted to assistant division engineer there.

NICKEL PLATE—Paul L. Montgomery, assistant engineer at Cleveland, Ohio, has been promoted to division engineer at Frankfort, Ind., succeeding **George F. Nigh** who has been transferred to Brewster, Ohio. Mr. Nigh succeeds **D. J. White** who has been promoted to assistant chief engineer, succeeding **R. L. Mays** who has been promoted to chief engineer, with headquarters at Cleveland. Mr. Mays succeeds **Harold F. Whitmore** who retired on May 31.

NORTH WESTERN—L. G. Tieman, assistant division engineer at Boone, Iowa, has been promoted to division engineer at Green Bay, Wis., succeeding **L. J. Deno** who has been promoted to assistant to chief engineer at Chicago. Mr. Deno succeeds **C. E. Hise** who has retired after more than 43 years of service.

READING—Robert A. J. Morrison, assistant vice president—operations and maintenance, Philadelphia, Pa., has been elected vice president—operations and maintenance, succeeding **E. Paul Gangewere** who has been elected president of the road. Mr. Morrison's former position has been abolished.

ROCK ISLAND—J. H. Kraemer, roadmaster at Manly, Iowa, has been transferred to La Salle, Ill., succeeding **J. K. James** who has been promoted to general roadmaster at Fairbury, Neb. **P. Poulton,** track supervisor at Tucumcari, N.M., has been promoted to roadmaster at El Dorado, Ark.

SOUTHERN PACIFIC—W. M. Jaekle, chief engineer, San Francisco, Calif., has been promoted to general manager there. **H. M. Williamson,** engineer maintenance of way, also at San Francisco, succeeds Mr. Jaekle as chief engineer and is in turn succeeded by **William J. Jones,** formerly assistant engineer maintenance of way and structures there. Mr. Jones is succeeded by **Alan D. DeMoss,** formerly assistant division engineer at San Francisco.

Lee D. Marsden, assistant division engineer at Tucson, Ariz., has been promoted to senior assistant division engineer at Sacramento, Calif. **David I. Pugh** has been appointed engineer of appropriations, San Francisco, Calif., succeeding **William L. Magle** who has retired, effective March 31, after 40 years of service.

UNION RAILROAD — Duane H. Layton has been appointed assistant supervisor—track.

Biographical briefs

Cecil F. Anderson, 41, who was recently promoted to division engineer on the Louisville & Nashville at Evansville, Ind. (*RT&S,* Jan., p. 10), was born at Lancaster, Ky., and graduated from the University of Kentucky in 1942 with a Bachelor of Science degree in civil engineering. Mr. Anderson entered the service of the L&N in July 1946 as a junior instrumentman at Knoxville, Tenn., being promoted to senior instrumentman in September of that year. He was promoted to draftsman at Louisville, Ky., in 1947; assistant engineer at Birmingham, Ala., in 1948, serving also in that capacity with the bridge department at Louisville; and assistant supervisor bridges and buildings at Louisville, in 1951. Mr. Anderson was further promoted to assistant division engineer at Evansville in 1952, the position he held at the time of his recent promotion.

Thomas E. Dolphin, 32, who was recently promoted to division engineer on the Canadian National at Prince Albert, Sask. (*RT&S,* April, p. 10), was born at Prince Albert and graduated from the University of Saskatchewan in 1950 with a Bachelor of Engineering degree. Mr. Dolphin entered the service of the CNR in 1950 as an instrumentman at Edmonton, Alta. He was promoted to resident engineer—construction two years later, assistant engineer at Winnipeg, Man., in 1953, assistant division engineer at Port Arthur, Ont., in 1955 and locating engineer the following year. In 1957 he was further promoted to project engineer, the position he held at the time of his recent promotion.

Virgil E. Glosup, 58, who was recently promoted to assistant vice president, operation - chief engineer of the Milwaukee Road at Chicago (*RT&S,* May, p. 10), was born at New Boston, Tex., and received his higher education at the Agricultural and Mechanical College of Texas. Mr. Glosup entered the service of the Milwaukee as a rodman at Chicago, being later promoted to instrumentman at Savanna, Ill. He also served in that capacity at Aberdeen, S. D., and Miles City, Mont. Mr. Glosup was further promoted to assistant engineer at Butte, Mont., division engineer at Miles City, and principal assistant engineer at Seattle, Wash., the latter in 1950. Three years later he was transferred to Chicago. He was advanced to assistant chief engineer, signals and communications, in May 1953 and acting chief engineer in March 1957. Three months later he was appointed engineer maintenance of way. Mr. Glosup was promoted to general manager, Lines East, in May 1959 and assistant vice president - operation seven months later. He was serving in the latter capacity at the time of his recent promotion.

Alan E. MacMillan, 38, who was recently promoted to construction engineer of the Boston & Maine at Boston, Mass. (*RT&S,* Feb., p. 10), was born at Cambridge, Mass., and graduated from Rensselaer Polytechnic Institute in 1949 with a Bachelor of Science degree in civil engineering. He entered railroad service in 1941 with the Boston & Albany, now part of the New York Central System, as a mail porter at Springfield, Mass., later serving as a valuation recorder at Boston. From November 1942 to October 1945 he was in military service with the U.S. Army, serving in North Africa and Italy with the 715th Railway Operating Battalion. After graduation from college he joined the Baltimore & Ohio as a rodman at Baltimore, Md., subsequently serving in that capacity at Clarksburg, W. Va. In 1951 he entered the service of the Chicago Great Western as an assistant engineer at Oelwein, Iowa. Mr. MacMillan joined the B&M in 1954 as project engineer at Boston. He was promoted to assistant engineer there later that year, assistant division engineer at Salem, Mass., in 1955 and assistant to chief engineer at Boston in 1956. Mr. MacMillan was serving in the latter capacity at the time of his recent promotion.

Robert N. Schmidt, 37, who was recently promoted to division engineer on the Frisco at Enid, Okla. (*RT&S,* April, p. 10), was

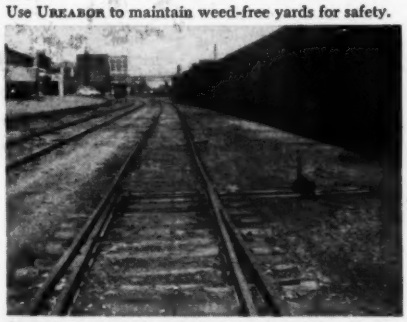
(Continued on page 51)

You can bet your budget dollars...

UREABOR stops weeds

A low rate of application effectively destroys weeds and grasses... prevents regrowth. Easy to apply...nothing to mix...no water to haul. Nonflammable, noncorrosive, nonpoisonous when used as directed.

Use UREABOR to maintain weed-free yards for safety.



UREABOR protects trestles from fire-hazardous weeds.

Use of UREABOR keeps signal areas clear of weeds.

You can maintain weed-free areas anywhere at low cost, with the least amount of labor, by choosing UREABOR weed killer for the job... *that's a proven fact!* But you get other benefits too! Service, for instance. Only capable, experienced field personnel promote the sales of UREABOR. They can stretch your budget dollar for weeds because each man is thoroughly trained to solve every specific weed problem. You get sound advice, backed up by years of field experience, on how to make the most efficient use of our herbicide material. You also have a choice of hand-operated or power-driven mechanical spreaders. Equipment specifically designed to apply UREABOR to best advantage and to fit into every field use.

As you may know, U. S. Borax & Chemical Corp. pioneered the field of dry herbicides... with particular emphasis on railroad requirements. Continuing research over the years has yielded our successful scientifically formulated herbicides. Each gives outstanding results on vegetation... each makes use of the proved plant-destroying action of borates. So, for *your* weed problems, get the right answers. Get in touch with us today to get the *most* for your weed-killer dollar!

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longer service life

is only one reason why FAIR is the world's largest selling rail anchor

T-POWER DESIGN MEANS LONGER SERVICE LIFE

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Railway TRACK and STRUCTURES

NEWS NOTES . . .

. . . a résumé of current events throughout the railroad world

A sharp increase in the number of reportable accidents is a certainty if a recommendation of the Senate Interstate Commerce Committee is heeded. That committee urged Congress to pass an accident-reporting bill which would deprive the Commission of the discretion it now has to determine which accidents shall be reportable and would require the reporting of any accident to any railroad employee who is thereby incapacitated for 24 hr. Present regulations call for reports only if injuries incapacitate the employee for 72 hr.

A direct wage hike of five cents an hour was recommended by a presidential emergency board which reviewed and passed on the demands of 11 unions representing railroad non-operating employees. This board also recommended the incorporation of the cost-of-living allowances in effect May 1, 1960 (17 cents), into the basic rate. The board's recommendations as to other proposals are not specific. They do call, however, for further negotiation between the parties with the view of liberalizing the welfare and health programs, and both the carriers and the non-operating unions have agreed to act on this recommendation.

An arbitration board awarded the Brotherhood of Locomotive Engineers a 4-per cent, two-stage wage increase. The daily rates will be increased 2 per cent effective July 1, 1960, and an additional 2 per cent effective March 1, 1961. The award also made the cost-of-living allowance of 17 cents part of the basic rate but it cancelled the cost-of-living escalator-clause provisions. An identical pact was concluded by the carriers with representatives of the Order of Railroad Conductors and Brakemen.

Four of the five operating brotherhoods have agreed to meet with management for preliminary discussions on the work-rules issue. The unions asked management to set the time and place for the meeting and suggested July 5, 6 or 7 as the date for the parley. The switchmen's union said it would not consider a discussion of work rules until a presidential emergency board has made its recommendations on a wage dispute between this union and the carriers.

Merger developments involving eastern roads were coming in rapid succession as this issue was going to press. First came an announcement of a plan of the Norfolk & Western to merge with the Nickel Plate. Shortly thereafter, the New York Central petitioned the ICC to delay any merger applications pending a study to consider the public's interest in the formation by mergers of new rail service patterns in the East. Then the Chesapeake & Ohio announced it had made an offer to Baltimore & Ohio stockholders aimed at acquiring control of the B&O through an exchange of stock. Whereupon, Alfred E. Perlman, NYC president, announced a special board meeting would be held June 24 to consider an offer to B&O stockholders, the objective being to work out a three-way merger with the C&O and B&O.

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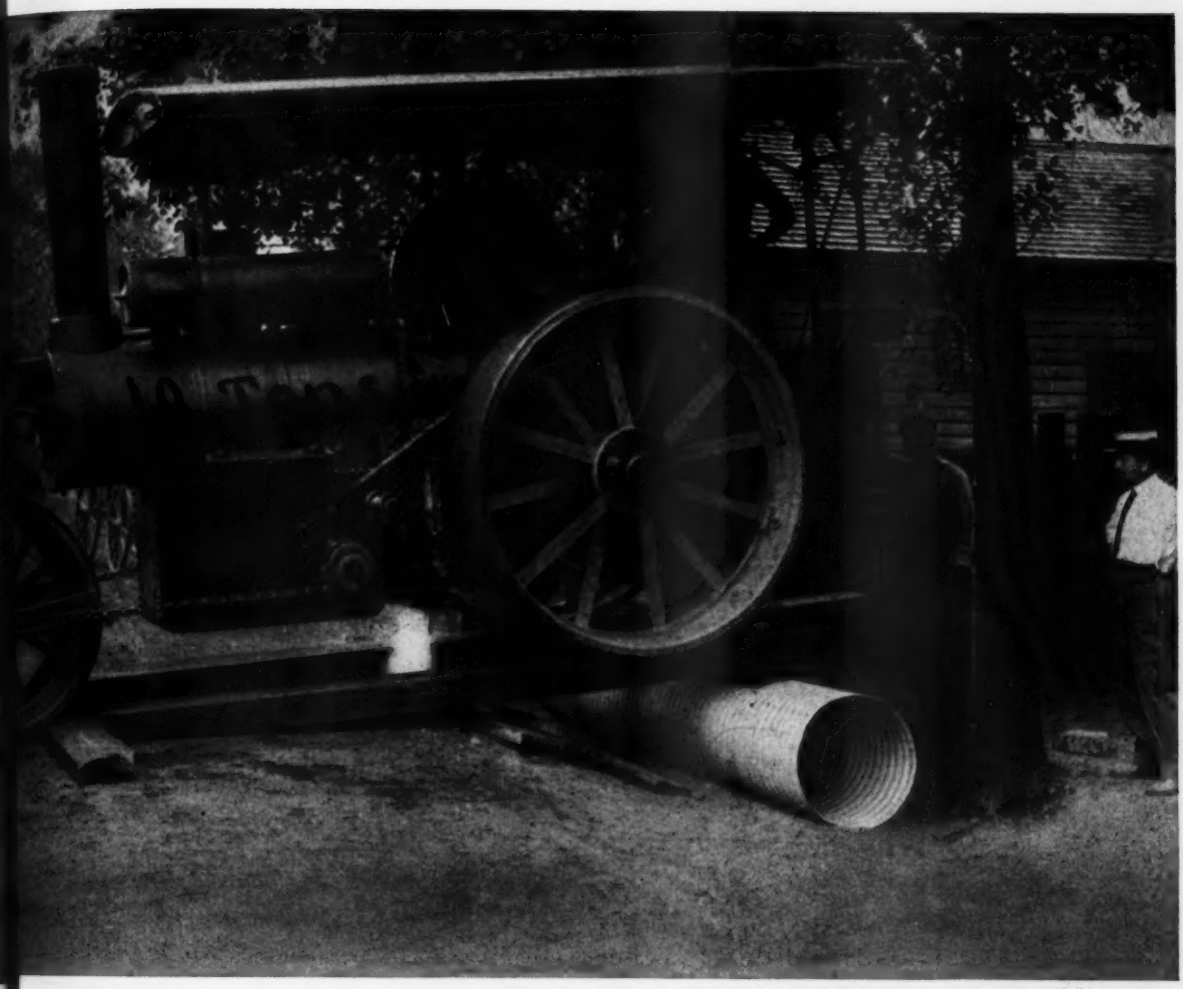

4

5

1. Inspection shows sewer in Pocatello, Idaho, installed in 1914, is in excellent condition. **2.** Armco SMOOTH-FLO® Sewer Pipe being installed for real estate development. **3.** This Armco Pipe functions as a conduit for utility lines under railroad. **4.** Armco Research Engineer checks 20-year performance record of Armco Pipe under the Pennsylvania Turnpike. **5.** Conveyor housing is a 96-inch diameter Armco Pipe.

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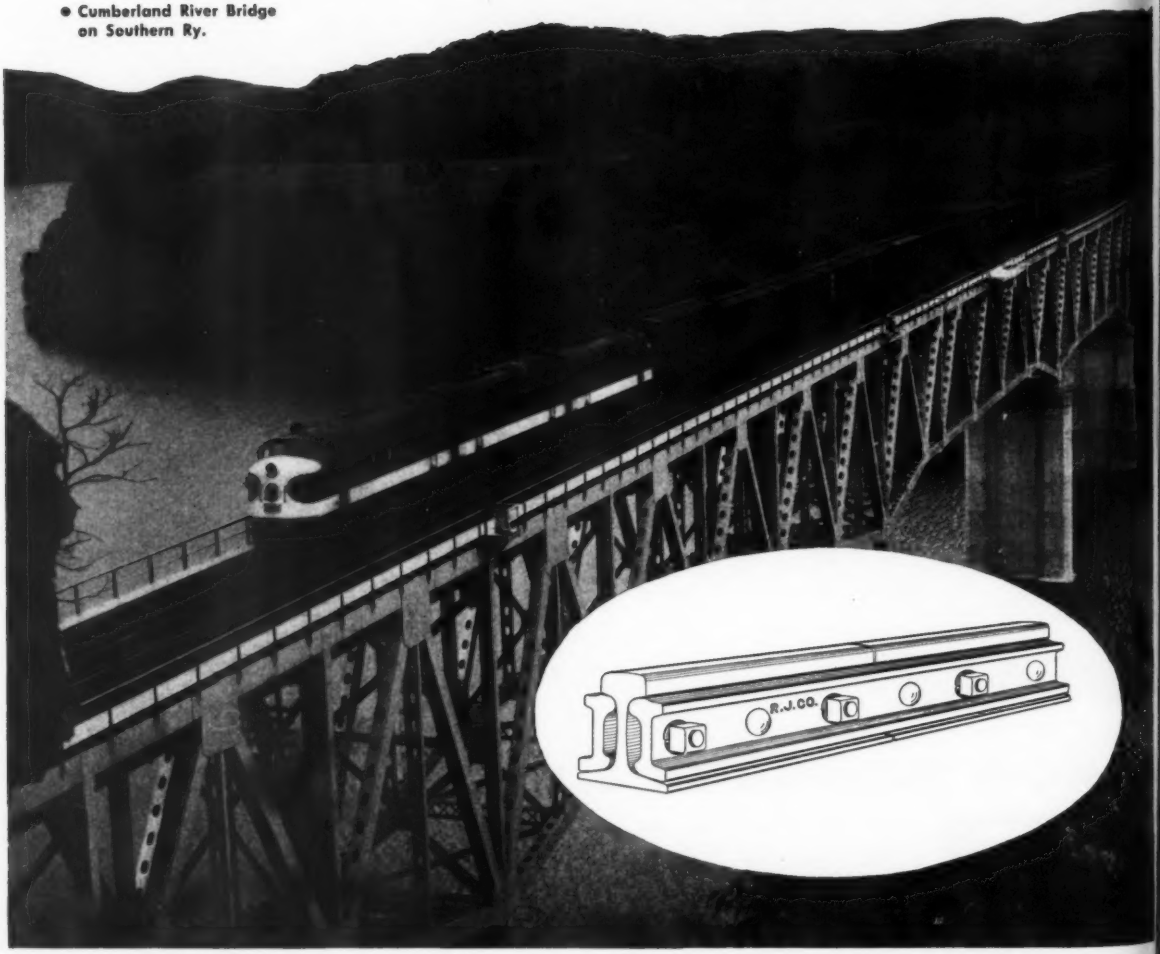

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PROGRESS REPORT

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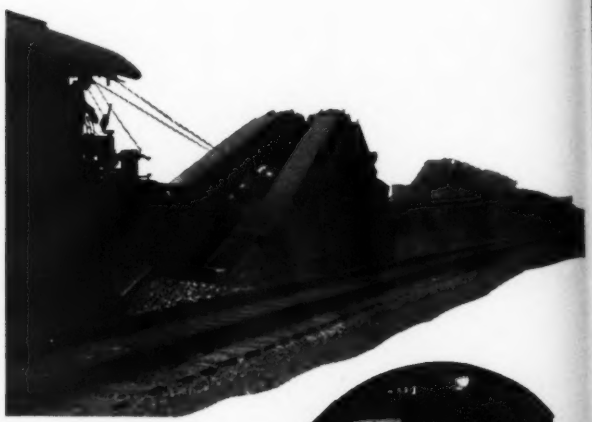

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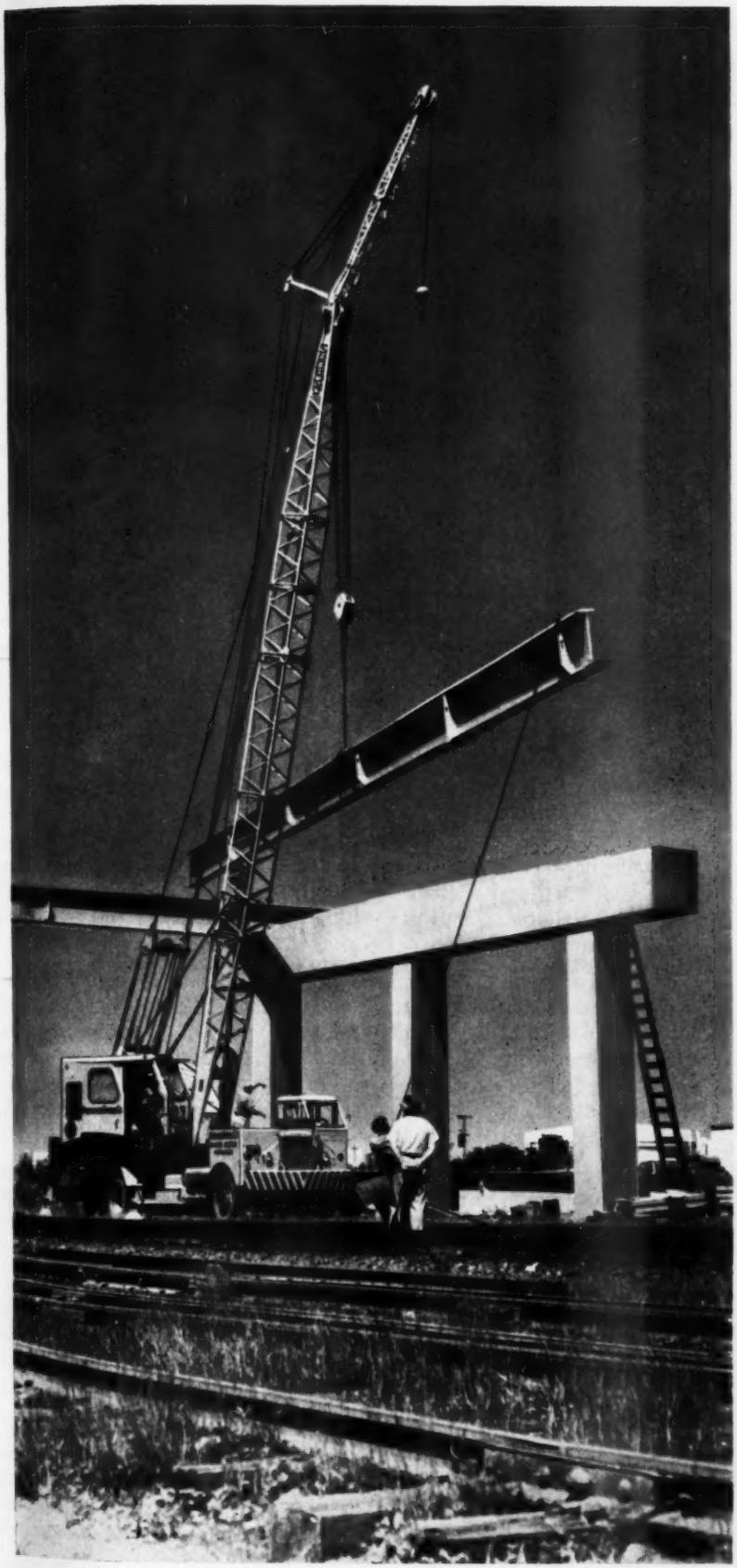

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What's the limit in stretching service life?

The condition of the fixed properties of the railroads is a matter of paramou concern to railroad engineering and maintenance of way officers. That bei the case, it is apropos at this time to raise some questions bearing on this subj

What is the overall condition of our railroad properties today? What is th condition of individual properties? Over the years has the condition been im proving or deteriorating? To get specific, what is the condition today compare to what it was ten years ago?

Undoubtedly officers on many individual lines have arrived at answers t these questions for their particular properties. Those who haven't may find i illuminating to do so. As for the industry as a whole, hardly anyone is in a pos tion to state categorically whether the condition of the properties has undergone improvement or deterioration in recent years. But we can at least refe to some statistics having a bearing on this question.

During the five-year period ending with 1950 the Class I roads installed new ties in renewals at an average rate of 32,800,000 per year. During the five-ye period ending with 1960 (using estimated figures for 1959 and 1960) the installed ties at an average rate of 19,260,000 per year. Average rail renewa for the five-year period ending with 1950 amounted to 1,460,000 net tons pe year. For the five-year period ending with 1960 the average rail renewals (agai using estimated figures for 1959 and 1960) will amount only to about 640,00 net tons per year.

It is thus apparent that the rate at which the railroads are putting materia back into the properties is far below what it was a decade ago. In evaluatin the effects of this decrease on the condition of the properties, we must, of cours give consideration to the measures now being used to get more life from ma terials. The fact that the tonnage of freight traffic hauled is at a somewhat lowe level than it was during the immediate post-war years is also a factor to b considered.

After due weight has been given these factors the question still remains Are the present rates of rail and tie renewals (and also for repairs to bridge and buildings) sufficient to restore the deterioration that is taking place due t wear and the effects of decay, corrosion, weathering, etc.?

In all probability the answer for at least some roads would have to be "no The existence of this state of affairs is no reflection on the engineering force They have to do the best they can with the money doled out to them by man agement. On many roads these funds have been on a relatively meager basi for years.

Maintenance officers have performed miracles in their efforts to maintain the properties with inadequate allotments. But the time may be approachi when the policy of stretching service life will have been carried to its limit. Th the need for putting back into the properties sufficient materials to compensa for the inroads of wear and other factors will again receive the consideratio it deserves.

Where the man-hours go

How much time do the maintenance forces spend on programmed work? Is it 50 per cent? Or 75 per cent? Perhaps as much as 90 per cent?

M/W men generally may be surprised to learn that for one large road only 43 per cent of the total maintenance man-hours is spent on programmed work? That is what the chief engineer of that road reported at a recent conference of the Railway Systems & Procedures Association (see page 28). Bear in mind he was talking about the most constructive, the most mechanized, and the most productive type of work—the real heart of maintenance.

This chief engineer learned this sad fact through an analysis of his operations as revealed by a cost-control IBM system. He also learned that 8.9 per cent of his man-hours was being expended on items over which he had no control, such as for vacations and holidays.

The remaining 48.1 per cent of the man-hours was used up on miscellaneous tasks. He found, for example, that a large proportion of the man-hours of his labor force was being used for non-constructive work for other departments. For instance, the equivalent of 67 men was employed for a whole year for hauling ashes and fuel and for cleaning stations and yard offices, and 265 more men were used just for cleaning cars.

The problem, of course, is to divert as many as possible of the man-hours now used on miscellaneous items to more constructive work. However, before anything can be done about it the items must be set down where they can be seen. Charges to operating accounts only will not do this. Cost control reports must be in sufficient detail to show precisely where the man-hours are going.

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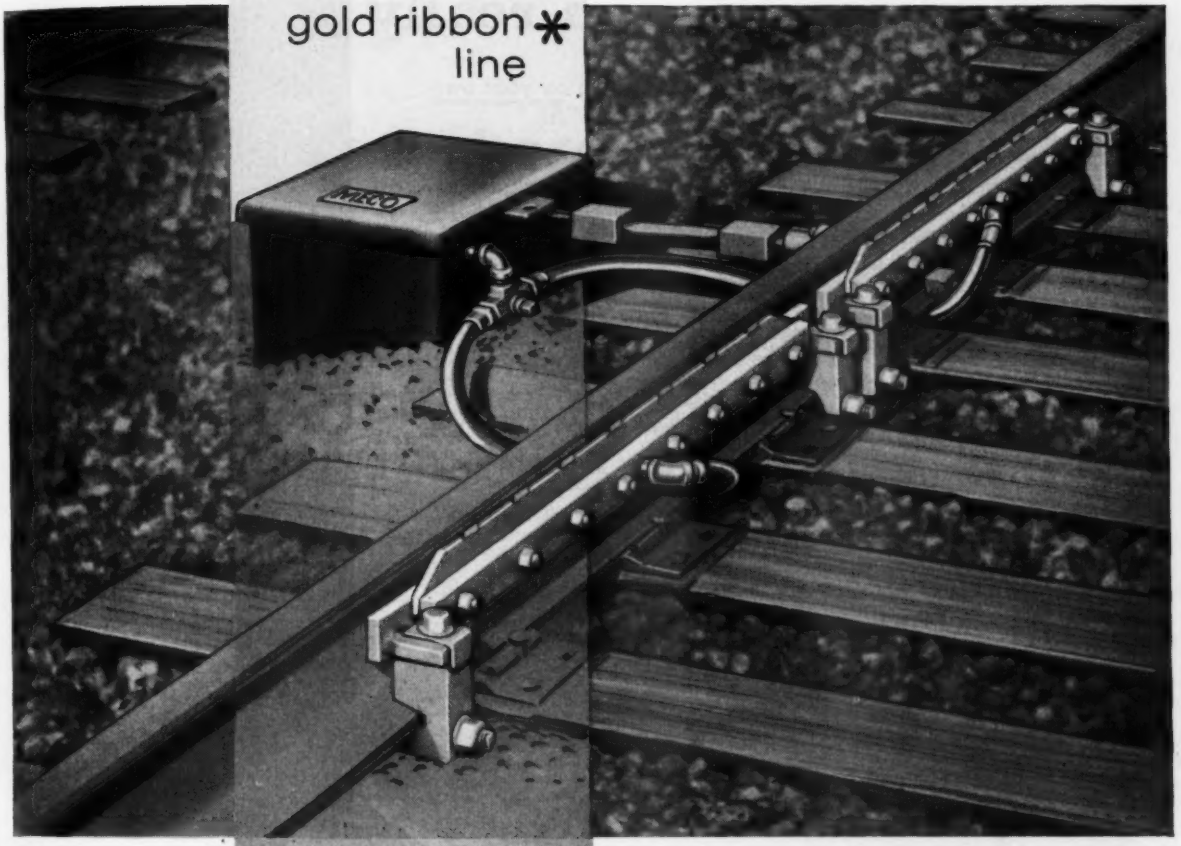

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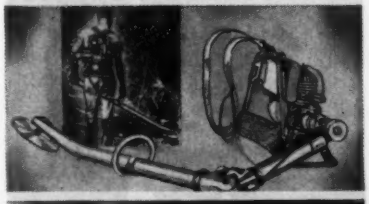

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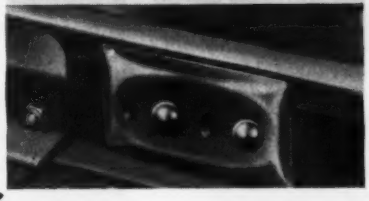

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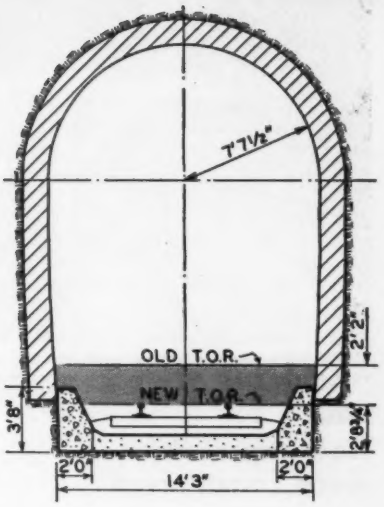
in 85-year-old Milwaukee tunnel

by cutting down here 2 ft ➧



A 1330-ft single-track tunnel on the Milwaukee, built in 1875, was presenting clearance restrictions to high-load traffic. To correct this condition the road constructed new curbs through the tunnel, removed the track, ripped out the rock floor to the necessary depth, constructed concrete cross struts and rebuilt the track. Careful planning permitted traffic to be restored in one week.

● Like most railroads, the Milwaukee Road found that the increase in piggy-back, auto transport and other high-load traffic was pointing up areas of limited clearance. One of these restrictions was a single-track tunnel at Tunnel City, Wis., on the road's main line between Chicago and the Twin Cities. The presence of this tunnel frequently necessitated the routing of extra-high loads by a less direct route. The road considered various plans for eliminating this restriction and decided that lowering the floor of the tunnel was the most economical one.

The tunnel, 1330 ft long, was bored through sandstone rock in 1875 on a line about 50 ft north of a previous tunnel constructed in 1858 and now abandoned. It has a five-course brick lining which is in excellent condition.

The road decided it required about 2 ft 2 in more vertical clearance (existing lateral clearance is ample) through the tunnel. However, this excavation would place the new floor of the tunnel below the base of its lining. To prevent any settlement or inward movment of the sandstone rock on which the lining rested, it was decided to confine it on each side behind reinforced-concrete curbs, extending the full length of the tunnel. It was also decided to tie the curbs together by constructing cross struts about every 12 ft.

To carry out this plan, a work procedure program was set up with the main purpose of minimizing the time necessary for the tunnel to be out of service. This program called for: (1) Construction of the curbs under traffic; (2) removal of the track through the tunnel and from the approaches; (3) excavation of the rock to the proposed floor elevation; (4) construction of the cross struts; and (5) reconstruction of the track.

Rock is unpredictable

The big question of this plan was the excavation of the rock. It was known that modern rippers would have no difficulty in penetrating the sandstone rock. But would the rippers make furrows only or rip out the stone in chunks? If passes of the rippers resulted in furrows, would jackhammers be required to remove the remaining ridges or could a front-end loader, using a bucket with teeth, dig it out? The answers to these questions would only be known when the actual excavation began.

However, the operating department had to be told when the tunnel would be taken out of service and for how long. Careful estimates were made of all work operations and it was believed that, with undisputed possession, the construction forces could complete the work in 14 days. Setting May 2 as "D-Day" and 4:00 am as "H-Hour," the operating department was advised of these plans.

A construction office was set up outside one end of the tunnel. It was equipped with a telephone so that work in the tunnel could be halted in time and the tunnel cleared for the passage of trains.

Other preparatory work included the extension of an electric power line from a local service to the tunnel premises and the stringing of 110-volt lines along each wall through the tunnel. Receptacles were spaced every 25 ft on these lines for lighting, and heating and for powering tools, such as concrete vibrators.

A 2-in air-supply line, with 1¼-in outlets spaced every 40 ft, was hung along one wall through the tunnel. A pressure of 100 psi was maintained in this line by a battery of four compressors set up outside the east portal. Moisture was removed from the air by receivers before entering the supply main.

A grade-reference line was established in the tunnel by nailing planks along each wall. These guide lines were used for obtaining the proper top-of-curb and floor-level elevations, and the track grade.

Work was started on the concrete curbs on February 15, 1960. The curb on one side was completed on March 18 before starting work on the other. The latter was completed on

CURBS were constructed on each side under traffic to prevent settlement of the sandstone beneath the lining.

REINFORCING BARS for curbs were fabricated by welding into 10-ft sections outside the tunnel, then brought in and welded into place.

How the curbs were constructed

April 14. Excavation was made by using 4-in spades in concrete breakers. In the beginning, twice a week, 160 ft of trench were excavated, reinforcing steel placed therein, forms set and the concrete poured. Later, when softer rock was encountered, it became necessary to excavate to only about 65 ft per day, place the reinforcing steel and forms and pour the concrete the same day. This latter practice was adopted to reduce the chance of the sandstone crumbling beneath the lining under the impact of the 70-mph trains and the vibration of the track. The excess material was loaded daily into two low-sided dump trucks which carried it to a disposal area, then returned and backed into the tunnel.

Plywood forms, 8 ft long, were used on the front side of the curbs only and these were reused repeatedly. The excavation in front of the forms was partially backfilled after placement to retain the track ballast under high-speed traffic. Each form length had eye-bolts fastened at each end so it could be pulled up vertically by chain hoists. The latter were attached to heavy pipe standards leaned against the walls. During cold weather, electric heaters were used within the forms to warm them before pouring the concrete, and the front sides were insulated. Also, the fresh concrete was covered during freezing temperatures.

Heated concrete, hauled eight miles from the plant, was brought into the tunnel by ready-mix trucks. The railroad wanted the best concrete it could get for this project. Pozzolith and fly ash were used for increasing its workability, durability and strength. Later, for the struts, where a very hard, smooth concrete, resistant to brine drippings, was required, the road used a special mix which included Plastiment with fly ash and extra cement to get a slow initial set with an accelerated set thereafter. All concrete was poured directly from the trucks into the forms and electric vibrators were used to insure proper consolidation.

While the excavating work and curb forms were being placed, and during periods when the tunnel was cleared for trains, the steel reinforcing was fabricated outside the tunnel into sections 12 ft long on special hangers. The strut reinforcing steel was made up in similar sections 10 ft long, placed in the trenches and welded to the protruding bars from the curbs.

On "D-Day," May 2, the tunnel was scheduled to be removed from service at 4:00 am. The track forces reported at 3:30 am, picking up and getting their equipment ready to start dismantling the track at 4:00 am. Track and tunnel were taken out of service as planned and at 4:02 am the crews entered the tunnel with mechanical spike pullers and power wrenches and removed the track fastenings. One bolt at each joint and the spikes in every fifth tie were left in place.

At 5:15 am two 25-ton cranes, with their booms pointed toward each other and with two front-end loaders back to back between them, moved to the

Cutting down floor, building struts

AFTER track had been removed, rippers were used to break up the sandstone. Front-end loaders pushed material out portals.

OUTSIDE the east portal, a front-end loader with a side-dump bucket loaded the excavated material into trucks for disposal.

PLANKS nailed along each wall served as a guide-reference line for the use of templates.

center of the tunnel to dismantle the track and remove the ties, working toward both ends. The track was dismantled in the tunnel by rolling the rails onto the adjacent concrete curbs, setting the tie plates and angle bars on the curbs and removing the ties from the tunnel. This was accomplished by two crews, each having a 25-ton crane and front-end loader with tie forks.

Working as separate units in opposite directions, each crew rolled a set of rails onto the adjacent concrete curbs. The loader then picked up 12 ties at a time twice with its tie forks and set them on a wire rope sling especially prepared to encircle 24 ties. Each crane then picked up the sling load of ties and backed out of the tunnel, dropping the ties into dump trucks stationed at both portals. The trucks transported these ties to Tunnel City where the ties were dumped and sorted. Meanwhile, another set of rails was rolled over onto the curbs by each of the two crews and each front-end loader scooped up and prepared another load of ties and placed them on slings for repeating this cycle. By 7:55 am this same day the track in the tunnel was dismantled and ties removed.

With the tunnel now cleared of the track and ready for excavation, the rippers were put to work. These were two TD-24 tractors equipped with ATECO hydraulically controlled rippers. One had a single-tooth ripper and the other a double-tooth. These machines made four passes through the tunnel, ripping 12 in into the rock on the first two passes and an additional 12 in on the last two passes.

A front-end loader was then worked in each end of the tunnel for pushing the ballast and ripped-up stone out the portals. A No. 977 Traxcavator shoved the material out the west portal, pushing from 3 to 5 cu yd at a time. A bulldozer took the material from there and spread it. Two scraper outfits picked up this and other material from track grading work and carried it to a waste area.

At the east end, a No. 955 Traxcavator pushed the material out that end of the tunnel. There, another No. 977 Traxcavator with side-dump bucket, loaded the material into six dump-trucks. The latter units carried it to the waste area where another bulldozer spread it.

After the material within 275 ft of each portal had been pushed out, two additional front-end loaders were used to push the material from the center of the tunnel each way to where the Traxcavators could pick it up and push it out. As this work progressed, men with pneumatic tools trimmed the high spots of the new rock floor.

With four machines working in the tunnel at one time, the fumes became strong and noxious. To correct this situation ventilating equipment on hand for such an emergency was placed in service. This consisted of one 31-in diameter and one 29-in diameter Hartzell vaneaxial blower mounted on separate trucks. The truck with the 31-in blower was moved into the center of the tunnel and the truck with the 29-in blower was driven to the west portal. Both blowers were put into operation, blowing in the same direction. After a very short time the former was sufficient to keep the air clear in the tunnel.

Grading of the approaches extended to about 900 ft east and 1000 ft west of the tunnel. To remove the track 900 ft east and 700 ft west of the tunnel, the rails were pulled back and fork-equipped loaders picked up the ties and loaded them onto trucks. The west 300 ft of track west of the tunnel was shifted to the north by a bulldozer and winch to clear the area to be graded.

By 6 am of May 3 the rough grade had been completed in the tunnel. Templates, supported by the guide strips, were used in forming the final grade. This was completed about 2:30 pm of the same day.

Meanwhile, as soon as the center of the tunnel had been brought to final grade, two crews of men began the excavation, form construction and placement of the steel reinforcing for the struts, starting just west of the center of the tunnel and working toward both portals. The grade had been made 1 in lower than necessary to allow for the deposit of the material excavated for the struts.

Set new target date

Because the rock excavation had progressed so well and so fast, a reappraisal was now made of the work schedule. By continuing the work on a 'round-the-clock basis, it was estimated that train service could be restored one week earlier than had first been anticipated. Accordingly, the target date for completion was set as May 9.

A special work pattern had to be developed for the construction of the struts. The weight of the ready-mix concrete trucks was such that it affected the sides of the strut excavations, so these openings had to be bridged. Since each ready-mix truck carried enough concrete to pour nine struts, the arrival of the trucks was timed about every three hours at which time nine struts had been prepared.

(Please turn the page)

AIR TOOLS were used for trimming floor to final grade and also for strut excavations.

All reinforcing was welded. Here, strut and curb steel is being connected.

Tunnel floor cont'd

As each strut was excavated, the forms were installed and the reinforcing steel was placed then welded to the projecting reinforcing steel of the curbs. Two welding crews were employed to allow 'round-the-clock production. Electric vibrators were used to secure proper consolidation of the concrete. The forms were allowed to remain in place for at least 48 hr before being removed. The last strut was poured at 2 am of May 6, and the last form was removed at 3 am of May 8.

The track forces then started to reconstruct the track. The position of every tie in the tunnel was marked on the concrete curb so as to prevent any ties from being placed over a strut after it was covered by ballast and before the concrete had completely set. Also the location of all struts was permanently marked on the curbs by scoring the concrete. New treated ties were used inside the tunnel and good treated ties were reused in reconstructing the track approaches to the tunnel.

Make the hours count

By 11:00 am on May 7, the track had been laid up to both ends of the tunnel and ballasted. Two 25-ton locomotive cranes were then used to reconstruct the track inside the tunnel, each working from one end toward the center. When working inside the tunnel, a crane, after depositing a bundle of ties, would lift a rail off each curb and set it in place on ties spaced from a previous load, then it would return to the portal for another bundle of ties. While the crane was bringing in another bundle of ties, the crew would spike the rails to every fourth tie, distribute and space the new bundle of ties, and apply the plates and joint bars. With the return of the crane, this cycle was repeated. By 7:00 pm of May 8, the track had been laid and joined in the tunnel. The track forces with bolt-tightening and spiking machines completed installing the rail by 10:30 pm of May 8, at which time a work train started to dump and spread the ballast in the tunnel, completing this work by 4 am on May 9. Track raising, tamping and lining power units were used to bring the track to final grade, surface and line. At 7 pm—one week ahead of the original schedule—the tunnel was restored to service.

Wabash tests explosive

● Manganese trackwork that has been repaired by welding is being work-hardened on the Wabash using the sheet-explosive technique.

The road started using the process for this purpose on an experimental basis in August 1959. It has used it for hardening manganese frogs, crossings and switch point protectors. For the experimental work the road has taken the material out of track and shipped it to its shop at Decatur, Ill., for repairing and work-hardening. The intention, however, is to do as much of the work as possible in track if the experiments prove successful.

The sheet explosive is a development of the Explosives department of E. I. du Pont de Nemours & Co. and was announced early last year *(RT&S,* March 1959, p. 44). Basically it consists of PETN (pentaerythritol tetranitrate) explosive combined with various ingredients that enable it to be produced in the form of sheets that are flexible and formative. It is furnished in sheets 10 in by 20 in and approximately 1/16 in thick. For use in hardening manganese castings it is cut to the desired size and shape to fit the surfaces to be hardened, being laid on the top surface and folded down the sides. A special adhesive is spread on the surfaces before the sheet is applied.

A special electric blasting cap is attached for detonation. When it is detonated the resulting impact hardens the manganese steel. Because it is the high velocity of the detonation that causes the surfaces to become hardened the process is called "velocity impact hardening."

The peak load applied during an explosion of the material is said to be uniform throughout a sheet and for all sheets of the same thickness. It differs only in proportion to the thickness of the sheets. The hardness and its depth can be controlled by varying

FLEXIBLE sheet explosive being cut by Wabash personnel to proper size and shape to fit top and sides of frog point. Man cutting is E. W. Knight, welding supervisor.

ADHESIVE is spread over surfaces to hold explosive in position. On the Wabash process is applied by welders under direction of welding supervisor.

...ve hardening

the thickness of the explosive used as well as the number of times the surface is impacted.

The manufacturer reports that the velocity impact technique has been successfully used to harden frogs without taking them out of track. The explosive, it is said, will not damage ties or disturb the roadbed, and does not create strong enough shock waves to damage nearby structures. Because the explosion noise may constitute a nuisance factor care is exercised in selecting locations where the work is to be performed and the technique to be employed.

On the Wabash the hardening work using the sheet explosive is done by welders under the supervision of the welding supervisor.

If the present experiments prove successful the Wabash will probably adopt the process as a permanent technique, according to Wm. J. Hedley, chief engineer.

STRIP of explosive is applied to frog point. The material is then smoothed to lie flat.

APPLICATION of blasting cap is final step in preparing for detonation. Cap is applied at right angles to edge.

EXPLOSIVE is detonated from safe distance. In this case the frog was taken out of service for repairing and hardening.

The audience

Many top engineering and maintenance officers attended the seminar and participated in the ensuing discussions.

Chairman and Speakers

Taking leading parts were D. T. Faries, ch. engr., B&LE, Greenville, Pa., who acted as chairman; F. L. Etchison, ch. engr., WM, Baltimore, Md., who was the first speaker; D. L. Jerman, ch. engr., P&WV, Pittsburgh, Pa., who was the second speaker; and C. J. Henry, ch. engr., PRR, Philadelphia, Pa., who was the final speaker.

A hard look at a timely subject | What's needed for short lo

Occasion: Seminar on Railroad Maintenance Programming.
Time, place: June 6, 7, Knickerbocker hotel, Chicago.
Sponsor: Railway Systems & Procedures Association.
Procedure: Panel speakers, then floor discussion.
Given here: Summarized report of the proceedings.

● The first speaker, F. L. Etchison, spoke on the factors which determine the standard of maintenance for individual properties.

Pointing to the increased activity in competitive forms of transportation, as well as to the rising costs of labor and materials, the speaker said these demanded the utmost return on the M/W dollar. The budget, he continued, offered the best means of planning expenditures and it becomes the yardstick whereby such expenditures can be controlled. However, a prerequisite for maintenance planning is the establishment of realistic maintenance standards. The latter, he added, are contingent upon the continued availability of funds.

Standards of maintenance, Mr. Etchison said, should be set at a level to insure speedy and safe operation. Yet, segments of the same railroad have a different degree of consideration as to the level or standard which should apply. Properties must be maintained with the expected traffic and utilization in mind. This looking ahead, he stated, is not overmaintenance nor wishful thinking, but is sound logic.

Materials are one of the chief ingredients of maintenance, said Mr. Etchison, and play the leading role in the establishment of a standard. Past experience in the use of specific items and the established standards of the American Railway Engineering Association, serve as excellent guides.

Must convince management

Referring to management requirements, Mr. Etchison said it is seldom that management insists that not enough is being spent for maintenance. But, he went on, maintenance officers must be able to convince management that the adopted standards must be maintained. Also, they must make their managements understand that, while they seldom hesitate in authorizing expenditures for machines for mechanizing some work, machines wear out and must be replaced for continuing economies.

In the discussion which followed this address, some maintenance officers stated that they had set up long-range programs for tie renewals, ballasting, and rail replacement for as much as five years ahead. Such programs were based upon long-range forecasts of expected revenue made by other departments. It was emphasized that these programs are plans only, but they serve to point the direction for maintenance expenditures.

It was brought out further that the long-range programs are subject to review annually and are adjusted upward or downward to conform with actual revenues. To provide for the eventuality of having to adjust downward, some roads assign an order of preference, such as "A," "B," "C," and "D," to jobs when budgets are made up. Hence, the "C" and "D" items can be cut off to make a downward adjustment. Other roads cut down on the improvement projects.

Long-range planning

The next phase of the discussion was presented by D. L. Jerman. He discussed long-range planning and how such programs are established and carried out. By long range, he said he meant five years.

In years past, said Mr. Jerman, with its abundance of labor and suppliers, a full maintenance program could be inaugurated in a matter of weeks. Today, orders for next year's program must be placed now.

Also, having committed ourselves to mechanization, Mr. Jerman said we must continue to supply machines with work. This requires a certain number of men and the necessary materials. As a result, he continued, we are working

D. T. Farles

F. L. Etchison

D. L. Jerman

C. J. Henry

long-range maintenance programming

with the limitations of a fixed capacity, a minimum number of men, and fixed interest and authorization charges. This means, he said, that we have lost our flexibility in respect to M/W procedures, and any attempt to alter monthly payroll to meet business fluctuations will be countered by higher inventory and machine costs.

Allot minimum funds

The matter of fixed expenses, the speaker continued, will be accepted by management with a great deal of reluctance because the last two remaining areas where it felt it had control of expenses lay in the maintenance-of-way and the maintenance-of-equipment departments. With this in mind, Mr. Jerman declared that management must be sold on the idea that minimum M/W expenses must be provided for if we are to derive maximum return from mechanization.

Mr. Jerman stated that good planning can be divided into four parts. One is recognizing the factors effecting the future of the railroad industry. Another is forecasting the future of the property. A third is preparing a plan, including the method of control and ultimate objectives. And last is getting the plan put into operation.

The future of a railroad is influenced, said Mr. Jerman, by such factors as labor, inflation, mechanization and automation, and technological changes. Labor costs, he continued, will continue to mount yearly, not only in increased hourly rates but also in increased benefits. Inflation he thought could be combatted by longer material service life through better products. In this connection, he said first cost now is not the prime consideration.

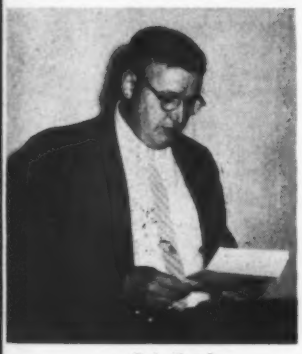
COFFEE BREAK provided time for stretching and for comparing notes on addresses.

Wants multi-purpose units

Referring to mechanization and automation, Mr. Jerman said he felt that today's equipment is designed for specific jobs which, as a result, makes it difficult to keep machines busy every day. It was his opinion that multi-purpose machines will increase efficiency and go far in reducing total equipment investment. Eventually, mechanization will reduce forces to the extent that no further significant reduction can be made. This will produce the technological change of shifting the emphasis in cost reduction to a search for longer lasting materials and for designs of structures requiring minimum maintenance.

Foremost in any forecasting of the future of a property, said Mr. Jerman, is the assembly of reliable unit prices and costs. In this connection, he felt it to be desirable to have such figures appraised by a representative cross section of the engineering and maintenance department, including supervisors and general foremen.

The preparation of the plan is the third step in planning. This is to adjust maintenance demands and needs to the predicted conditions, Mr. Jerman said, and thus obtain the maximum efficiency for equipment and the largest return on the capital invested. This plan, Mr. Jerman explained,



C. L. Towle

F. S. Hutton

R. H. Carpenter

They summarized

A concise review of each of the three phases of the subject was made by committees headed by C. L. Towle, ch. engr., DT&I, Dearborn, Mich.; F. S. Hutton, engr. m. of w., CNR, Toronto, Ont.; and R. H. Carpenter, engr. m. of w., MP, St. Louis, Mo.

Maintenance programming cont'd

should be realistic and cover the first year period in detail and, if based on a five-year study, the other four years in general objectives.

The last step in preparing a program is installing it and making it work. This, he continued, is primarily a company organization problem.

In conclusion, Mr. Jerman said that planning is only a process which enables the department to meet the contingencies of the future. Also, it is a device to coordinate all facets of M/W operations.

In the discussion which followed, a question was raised as to whether or not long-range planning was just a waste of time because of needed adjustments to fit changing conditions. The general opinion was that such planning gave a target to shoot at.

Another officer stated that long-range planning permitted his road to upgrade several branch lines where the operating department ran only one train a day. This enabled the train to go faster and return to its point of origin on the same day, resulting in substantial operating savings.

However, one weakness of cycle maintenance was brought out. One road which had pioneered in cyclical maintenance, found that, because the original cycle had called for it, more ties were being renewed in the field than was actually necessary. To correct this situation, tie renewals now are being made only from field inspections.

Program control

The third phase of the seminar was given by C. J. Henry, who spoke on the control of maintenance programs.

In describing the establishment of a maintenance program, Mr. Henry said that the amount of money allocated for M/W work is predicated upon a percentage of an estimated volume of traffic. After the amount has been determined, the expenditures are broken down into various items on a system basis, after which they are further divided by regions and divisions.

All items of maintenance are considered. However, of the 23 items for which money is allocated, Mr. Henry said that eight were items over which a maintenance officer has little or no control. These include depreciation, regional overhead, health and welfare, injuries to persons, thrift plan, medical care plan, system overhead and miscellaneous emergencies.

Detailed estimates

Mr. Henry then described the establishment of annual programs on his road. Starting in November, the regional engineers assemble data for their work programs for the following year. This is obtained from the supervisors of tracks, structures and communications and signals, who list their projects by mile posts. A detailed estimate of the cost is made for each item, as well as the number and type of machines required, the number of man-hours to be used, the importance of the work item, and the dates that the work is to start and finish.

A tentative budget is submitted about the middle of December for the following year, after which it is submitted to the System Finance Committee for approval. The approved budget items are furnished in a bound pamphlet for each district.

On the third Tuesday of each month, Mr. Henry said, the regional engineers attend a budget meeting at the road's headquarters. At this meeting, each region is given a total amount that may be spent in its territory for the following month. The monthly allotments are directly related to the estimated revenues and vary from month to month in proportion to the traffic volume. The regions then revise their estimates to conform.

Controlling factors

The principle controlling factors in any budget, said Mr. Henry, are the men and materials. Also, to carry out program work, it is essential to have an annual inventory and inspection of machines. From this information, periodic overhaul work is programmed.

The methods of performing work on the Pensylvania are subject to constant study. Costs of performing work also are subject to continuous analysis. Through such studies, he said, considerable data are obtained upon which to predicate future budget estimates.

Another means for controlling the work program, he added, is through the use of monthly progress reports. At the same time, production and quality standards are followed through on-the-ground inspections made by system and regional officers.

Need cooperation

Concluding his remarks, Mr. Henry stated that one of the most important items in the programming of mechanized gangs is the complete cooperation of the traffic and transportation departments. This, he added, requires careful planning and education. He has found that illustrated lectures, during which cost data expressed in man-hours are presented, are helpful in getting across the maintenance man's story.

The seminar closed after the presentation of summaries of the subject by three teams.

CTC—Its Effect on M/W work

What does CTC mean in terms of off-track equipment?

Does CTC make it easier to get the track?

What do you need to know to use CTC to best advantage?

What does CTC mean to maintenance-of-way expenses?

● "I believe the overall benefit from track abandonments permitted by CTC gives us maintenance savings which help keep our railroads an efficient medium of transportation . . . ," said C. E. R. Haight, chief engineer of the Delaware & Hudson.

Mr. Haight was speaking at a recent meeting of the Metropolitan Maintenance of Way Club at New York on the subject "Centralized traffic control and maintenance of way." He stated at the outset that his comments on the subject were based on experiences gained through the use of this method of train operation on the D&H since 1930. In fact, when current projects are completed, he said, 66 per cent of the road's main line, exclusive of branch lines, will be CTC territory. This will have resulted in the abandonment of 168 miles of main tracks, he said.

The address consisted basically of answers to four questions.

● What does CTC mean in terms of off-track equipment?

Mr. Haight said that, in his opinion, CTC has two principal results in relation to off-track equipment: (1) Due to the reduction in trackage by converting a main line from 2 tracks to 1 or from 3 or 4 tracks to 2 it becomes essential to use more off-track equipment, particularly in the first case; and (2) greater opportunity is provided for the use of this type of equipment by removing abandoned tracks and using the areas parallel to the remaining tracks as roadways for the movement of trucks and machines. He said the D&H now has 106 miles of such roadways and expects to gain an additional 54 miles when current projects are completed.

Mr. Haight said that it was his belief that "gain of the roadways adjacent to remaining tracks makes the working of off-track machinery an essential condition in the design of our track equipment." In addition to using them for truck-mounted cranes, highway trailers and similar equipment he believes "we must also take full advantage of these parallel roads with our mechanized maintenance work, that is, tie renewals, surfacing, ditching, rail renewals and the like."

Mr. Haight pointed out, however, that the parallel roadways are not without problems since they have to be maintained.

● Does CTC make it easier to get the track?

According to Mr. Haight, officers of the D&H feel that track occupancy by M/W forces has been simplified where CTC has been installed. The reason for this belief, he said, is that the dispatcher is able to glance at his console and see what train situation exists at any particular location. He cited this example: In a location where two tracks are operated under CTC the dispatcher, by proper setting up of routes and signals, can handle traffic on one track while letting maintenance forces work on the other track. He commented that this procedure would be the same as taking a track out of service.

● What do M/W men need to know to use CTC to best advantage?

The answer to the third question, he said, lies in being sufficiently familiar with the workings and problems of other departments to be able to discuss and plan a job with their supervisors. The aim of this discussion would be to accomplish the work "with the greatest efficiency possible and with the least interference possible to the primary function of the railroad . . . the handling of our railroad traffic."

Mr. Haight cited the following items which a maintenance-of-way man should know before planning a job with transportation officers: (1) Operating rules applicable to CTC; (2) manner in which the CTC territory is set up to work (for example, which tracks are equipped for double running, those equipped for single direction operation and the limits of the CTC territory); (3) train traffic to be handled; (4) cost of a particular gang in wages per day, including its cost when idled for an hour; (5) effect of any excessive running time on job cost; (6) length of time required to accomplish the work; and (7) amount of track space required to get equipment in the clear.

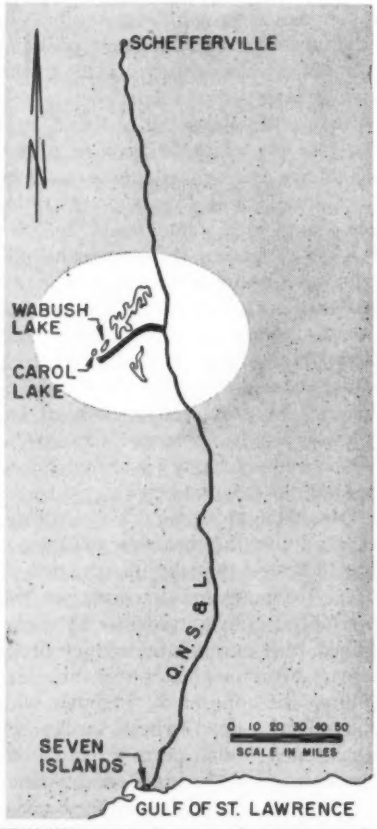
● What does CTC mean to maintenance-of-way expenses?

Mr. Haight answered the last question by stating that basically CTC means a reduction in maintenance-of-way expenses because of "the ability to handle railroad traffic on less trackage than would otherwise be required . . . ." This effects savings in track maintenance, he said, even though the resultant increase in tonnage over the remaining track or tracks increases the cost of maintaining them.

It is generally agreed, he said, that the extent to which an increase in traffic affects track-maintenance costs is considerably less than a direct ratio. He stated that some years ago the AREA developed figures which indicated that about 33 per cent of maintenance costs were effected by increases in traffic. Even the cost of additional high speed turnounts, he said, which require a high standard of maintenance in order to function as intended, are compensated for by the elimination of many crossovers when reducing double track to single track.

Mr. Haight summarized his remarks by saying that "our experience has indicated that the introduction of CTC, in many cases, increases the amount of single track to be maintained with its track occupancy problems." "But the greater operating flexibility," he continued, "together with the space gained where tracks are abandoned, which permits use of off-track equipment, permits maintenance work to be carried out within reasonable costs under most conditions."

AS TRACTORS pull long rails off cars the strings come to rest on rollers 74 ft apart.



NEW LINE serves iron ore developments in vicinity of Wabush and Carol lakes.

Build 37-mile line in L

When building a new railroad using rails welded into long strings how do you get the long lengths into position on the ties? This was one of the problems encountered in the construction of what is, in effect, a branch of the 357-mile Quebec, North Shore & Labrador, built several years ago to tap iron ore reserves in Quebec and Labrador. There were other problems, too, such as those involved in building a railroad in a country where the natural materials are not suitable for subgrade construction.

● Laying long strings of welded rails in existing track is one thing; building track new with such rails is another.

That's the problem that was encountered in the construction of a new 37-mile single-track line in Labrador. The procedure worked out for laying the 1,000-ft strings was just the reverse of that commonly used to lay long rails in relay operations. Instead of pulling (or pushing) the string of cars out from under the long rails the latter were pulled off the cars two at a time and out onto the previously placed ties. With these two lengths lightly spiked in position the cars were moved ahead to the end of track to allow the next pair of rails to be unloaded. Daily production; 6,000 ft of track per day.

The new line on which this procedure was followed is, in effect, a branch of the Quebec, North Shore & Labrador. The latter, 357 miles long, was built several years ago to carry iron ore from Schefferville, Que., to tidewater docks on the Gulf of St. Lawrence at Seven Islands, Que. This railroad extends practically due north

CROSSTIES are delivered in bundles of 25 and distributed by fork-lift tractors (above). When rails had been unloaded they were lowered onto ties (below) by screw-type adjustment on rollers.

n Labrador with 1,000-ft welded rails

from Seven Islands (see map).

Construction of the branch is a joint undertaking of the Iron Ore Company of Canada, which also owns the QNS&L, and the Wabush Iron Company Ltd. To own and construct the new line these companies, early in 1959, set up the Northern Land Company Ltd. which they own on an equal partnership basis.

Why a new line?

The line is being built in anticipation of shipments of ore from the Carol Lake mine of the Iron Ore Company of Canada and the Wabush Lake mine of the Wabush Iron Company. Although the Carol Lake mine isn't expected to go into production until early in 1962, and the Wabush Lake mine some time in 1965, the branch is being rushed to completion this year to handle shipments of heavy machinery to the mine sites.

To reach these mining operations the line was projected westward from a junction with the QNS&L at a point 224 miles north of Seven Islands. As to grades and curvature the line is built to the same specifications as the QNS&L. The maximum grade against loaded trains is 0.4 per cent compensated, and the maximum against empties is 0.85 per cent, also compensated. The maximum curvature in use is 5 deg, with only one curve in this category. The remaining curves are 4 deg or less.

The track is laid with 132-lb rail continuously welded by the flash-butt process into strings 1,000 ft in length. The ties are 9 ft in length, 7 in. by 9 in. in cross section, and are equipped with double-shoulder 14-in tie plates, anchor spiked in position using the Spencer spike. When completed, the ballast section, consisting of crushed rock, will be 24 in. in depth and will extend to a width of 18 in beyond the ends of the ties.

The work of welding the rails into 1000-ft lengths was done under contract by Matisa Railweld, Inc., which set up its welding plant in the Iron Ore Company's yard at Seven Islands. The original intention was to ship the long rails directly to the job after welding. However, due to delay in the delivery of ties, it was necessary to stockpile the rail at Seven Islands and rehandle it at a later date when adequate numbers of ties had arrived. Preparatory work included the fastening of the tie plates to the ties before they were shipped to the job.

How track was built

Here's how the track-laying work was carried out:

This operation was scheduled on the basis of 6,000 ft of track per day, complete except for ballast. All parts of the operation were geared to this daily quota. The work for each day began with the loading of a string of empty ore cars with 12 of the long rails, or sufficient to lay 6,000 ft of track. These were placed on the cars in a single tier.

The rails were shipped to the job in the same consist with the required number of ties for a day's tracklaying. Prior to loading, the ties were assembled in bundles of 25. Each night, after the day's rail-laying operation

LARGEST BRIDGE on new line is a 320-ft girder structure spanning the swift-flowing Ashuanipi river at Mile Post 4. This view shows one of the girders being erected.

THERE are two major culvert installations. Shown here are 6 lines of 144-in Multi-Plate pipe which pierce the embankment at Wabush narrows. The line skirts several lakes.

Build new line with long rails cont'd

had been completed, the ties for the next day's work were distributed. In this operation the bundles were placed at pre-determined locations along the grade. With the bundles broken, fork-lift tractors were used to place the ties in their correct position. Special care was taken in lining the ties properly before the rail laying commenced.

Track-laying operations started with the morning shift when the train-load of long rails was moved to the end of steel. Preparatory to the rail-laying operation roller assemblies, specially developed for this job, were distributed ahead of the rail train, being spaced 74 ft apart. To start the day's work two lengths of the rails were pulled ahead on the roller assemblies until the rear end of each string matched the forward end of the last length laid. At this point the strings were lowered into position using a screw-type mechanism incorporated in the roller assemblies. Another feature of the assemblies permitted them to be collapsed so they could be removed from under the rails.

Two small crawler tractors were used to pull the rails forward. With a tractor positioned on each side of the track a "whiffle-tree" arrangement was used to transmit pulling force to the rails.

Spike every fifth tie

When each pair of strings had been placed in position on the tie plates, joint bars were applied, and each fifth tie was spiked to hold the rails to gage while the rail train moved forward into position for unloading the next lengths.

Behind the rail-laying operation a production spiking crew completed the spiking, and two rail anchor machines applied the anchors. The spikes and rail anchors were distributed from the rail train as it moved forward.

Ballasting operations are now under way and it is expected that this work will be completed by October 1 of this year, according to B. M. Monaghan, manager of the Northern Land Company, who is in charge of the construction of the new line. Mr. Monaghan is also chief engineer of the QNS&L.

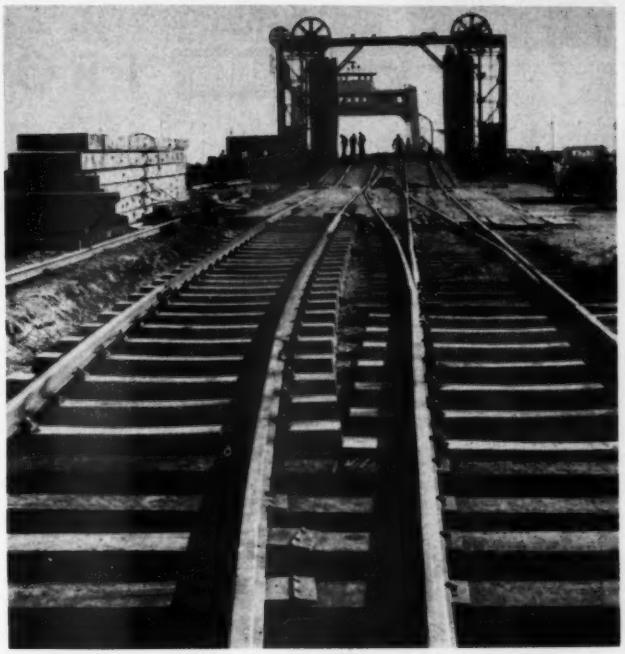
Materials not suitable

In general the line follows the "natural grain" of the country. It crosses the Ashuanipi river at Mile Post 4, follows the shores of several large lakes in the vicinity, and crosses two muskeg sections of considerable size. Much of the line is located in country where the natural materials are not suitable for subgrade construction due to their frost susceptible characteristics. This necessitated the wasting of materials excavated from cuts and ditches and the borrowing of suitable material for the fills from large borrow pits located elsewhere. Where unsuitable materials were encountered in cuts and in shallow fill areas excavations were made to a minimum depth of 6 ft below subgrade and backfilled with granular material. Solid rock was encountered in only three cuts of major importance.

Grading operations were started in May 1957 and were completed by January 31, 1960. A total of 4,260,000 cu yd of material was moved. Other major construction features include a bridge 320 ft long across the Ashuanipi river and two major culvert installations consisting of multiple lines of 12-ft Multi-Plate pipe.

WP installs prestressed concrete ties

A test installation of 45 prestressed concrete ties has been made by the Western Pacific in the approach tracks to a ferry transfer bridge (right) at San Francisco. Designed by Ben C. Gerwick, Inc., in conjunction with WP engineers, the ties are 8 ft 6 in long and vary in width to a maximum of 12 in across the bottom. The top surfaces are canted 1:40 from each end toward the center to provide the proper cant for the rails. Installed in March, they are spaced a maximum of 30 in apart. Three types of fastenings were used.



News briefs in pictures . . .

Students tour line change

Several groups of civil engineering students recently inspected the Santa Fe's 44-mile line change now under construction between Williams, Ariz., and Crookton. The students came from colleges and universities in Santa Fe territory and spent two days as guests of the road. Their host was Roy W. Stane, the Santa Fe's construction engineer on the job (above left), who conducted the tours and explained the work. Reason for the tours was explained this way by R. H. Beeder, Santa Fe system chief engineer: "Many of today's civil engineering students have the idea that current railroad operations offer them no challenge and little opportunity. Nothing could be further from the truth and we felt a visit to this major engineering project . . . would be an awakening." In photo at left Mr. Beeder (third from left) explains a rock core brought up by drill rig to one group of students and a professor.

PRODUCTS

Free-swinging blades for . . .

Brush cutters

TWO MODELS of Covington cutters are available for use with tractors for clearing brush and grass from the right of way and other areas. The Model R, lift type (shown by photograph), is designed for use with tractors equipped with three-point lifts. It has a fully adjustable tail wheel that rotates through 360 deg allowing it to turn immediately when backing up. The Model RD, pull type, has two side-mounted wheels and is attached to a tractor's drawbar for operation. Height of cut of each model is adjustable from 1 to 12 in. Width of cut is five feet.

Each model has two 10-lb free-swinging underserrated blades located on the underside of the unit to chew up material pushed over by the tractor. The blades are attached to the outer edge of a 70-lb flywheel-type cutter which is welded to the shaft. The flywheel is protected by a heavy-steel shield which is designed to slide the entire machine over stumps and rocks without damage to the cutter or towing unit. A safety clutch protects the cutter from being stopped by clogged material. Standard equipment includes a shredder bar for fine mulching. *W. F. Covington Planter Company, Inc., Dept. RTS, Dothan, Ala.*

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Larger hexagon head for . . .

High-strength bolts

NEWLY DESIGNED high-strength bolts are available which have a greater bearing area under the head due to the width of the head being increased to the same width as the nut. Ranging in diameter from ½ to 1½ in, the new bolts conform to ASTM specification A-325 and are stated to allow tension to be raised from 90 to 100 per cent of minimum proof load. The new minimum bolt tension ranges from 12,050 psi for ½ in bolts to 103,950 psi for 1½-in bolts. The bolts and nuts are specially heat treated and are impact formed from controlled analysis carbon steel. Features claimed for the bolts include high clamping force, excellent fatigue resistance and ease of installation. One of the advantages pointed out for the new bolts is that both bolt and nut can be torqued with the same size wrench or socket. *Screw & Bolt Corp. of America, Dept. RTS, Pittsburgh 30, Pa.*

New products for line of . . .

Building materials

TWO new additions to The Thoro System line of building materials have been announced. One, known as Thoropatch, is a crack resistant material for concrete, brick or masonry repairs. The other is called Thorospan and is a compound for calking, glazing or sealing metal, glass, masonry, wood and concrete.

Thoropatch is said to be a hard, self-curing, waterproof, acid-resistant, non-shrink material for either interior or exterior use. Features claimed for it include high adhesion without priming, etching or roughening and high compressive strength.

Thorospan can be used in both interior and exterior joints and is available in three colors, black, aluminum and gray. It can be applied with putty knife, trowel or calking gun in overhead, sloping, vertical and horizontal joints. Features claimed for the material include retention of elasticity regardless of temperature, stress, pressure or vibration and maintenance of adhesion between materials of different textures and coefficients of thermal dimensional changes. *Standard Dry Wall Products, Inc., Dept. RTS, New Eagle, Pa.*

•

One-coat pigmented . . .

Bridge coating

A NEW product, known as NO-OX-ID "AZ," has been added to the Dearborn line of rust-preventive coatings. It is a one-application, metallic-pigmented coating that dries to a firm silvery finish. The coating is designed to give a high degree of mechanical and chemical protection to structures exposed to severe corrosive conditions. Incorporating a specific vehicle for spray application, it is claimed to penetrate and loosen slab rust and curled paint and dry to a finish that can be stenciled. Also, that only spot touchups are required to maintain the coating after original application.

The manufacturer states that the material can be applied to a painted surface after limited surface preparation, consisting of removing loose rust and other extraneous material. The coating will then adhere well to the old painted surface, it is claimed. *Dearborn Chemical Company, Dept. RTS, Merchandise Mart, Chicago 54.*

(Please turn the page)

Performs four operations . . .

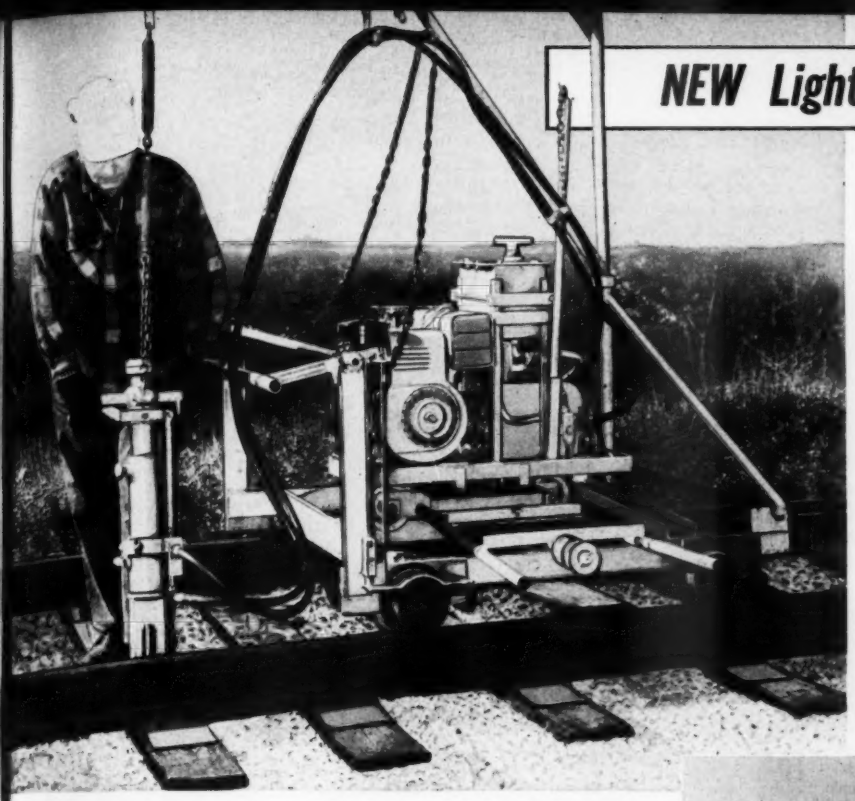
"Combination" machine

OPERATED by one man, the new McWilliams "Combination" machine is designed to perform four track-maintenance operations. These include jacking the track, after determining low spots with a surfacing device; tamping the ties; alining the track and regulating or dressing the ballast.

The basic unit in the Combination machine is the McWilliams production tamper, powered by a diesel air compressor. The new machine is equipped with hydraulic jacks at the front of the unit; a special 16-tool tamping head, split four ways for tamping switches; an RMC LineMaster lining head and hydraulically controlled ballast regulating wings. It is also equipped with manifolds at front and rear to permit use of other air tools, such as hand guns, spike drivers and torque wrenches. *Railway Maintenance Corporation, Dept. RTS, Pittsburgh 30, Pa.*

NEW Lightweight Carriage

speeds operation of NORDBERG Hydraulic SPIKE PULLER



Ready for spike pulling operations, the Nordberg Hydraulic Spike Puller and Carriage is compact, easy to operate. Note arm and chain support for the gun, and the push bar which also acts as a brake release.

• Adding to the versatility of the Nordberg Hydraulic Spike Puller, a new lightweight, aluminum frame carriage has been developed to further improve spike pulling operations on tie renewal jobs. Featuring high speed pulling and less operator fatigue, this new unit may be used with any new or existing Nordberg Hydraulic Spike Puller.

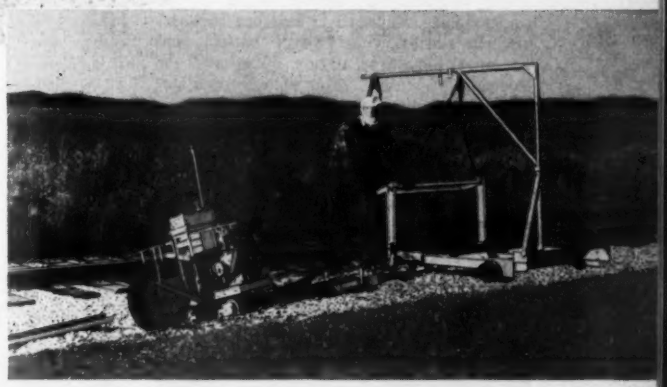
Actual tests show that the new carriage greatly increases high production spike removal. In one such test, 360 spikes, 4 spikes to a tie, were easily pulled by one man in 30 minutes . . . *that's 720 spikes per hour, or one every five seconds.*

In pulling spikes, the operator swings the pulling gun into position, fits the claw over the spike head, presses the trigger, and pulls the spike . . . which is automatically ejected as the claw returns to pulling position.

This versatile Nordberg Hydraulic Spike Puller and Carriage is a time and money-saving investment on many jobs. It can be used with equal effectiveness in yards, terminals, on bridges, and on all-around rail renewal work.

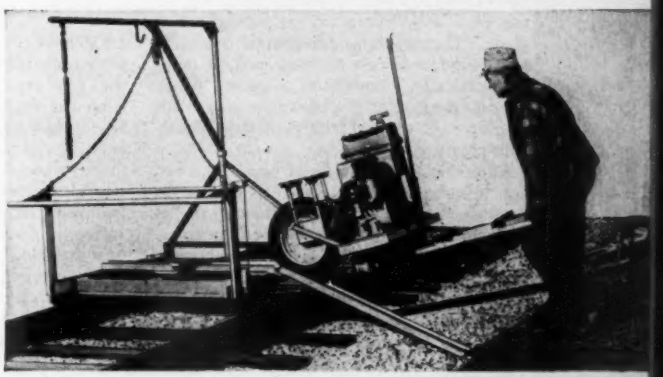
Write for complete information.

NORDBERG MFG. CO.
Milwaukee 1, Wisconsin



Preparing for spike pulling operations, the operator easily lifts the aluminum-framed Spike Puller Carriage onto the track.

With the Carriage on the track, the Spike Puller is easily rolled up the aluminum set-off ramp into position on the Carriage.



NORDBERG *Mechanical Muscles*

Write for LEASING Plans

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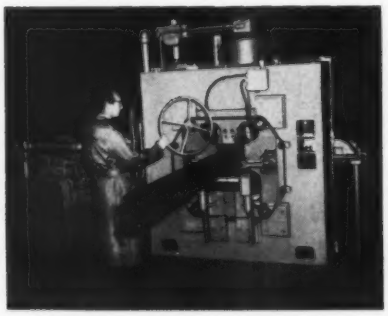
R358

Low operating speed for . . .

Air compressor

DESIGNED to deliver 600 cfm of air at 100 psi, the new Schramm Model 600-TC Unistage portable air compressor is driven by a turbocharged diesel engine which operates at 1200 rpm. The low operating speed is stated to give the engine longer life with less maintenance and servicing.

The 600-TC is equipped with a single liquid cooling system which circulates through the entire unit. The manufacturer states that this system permits both engine and compressor to be brought up to operating temperature before being placed under load. Standard equipment includes electric starter with 12-volt battery and generator, lockable sliding doors and the Pneumastat which automatically regulates speed to demand. *Schramm, Inc., Dept. RTS, West Chester, Pa.*



Rails straightened with . . .

Hydraulic press

BENT RAILS can be straightened by the use of a new hydraulic rail straightening press. The machine consists of two 200-ton cylinders which are designed to operate vertically, two 80-ton cylinders which operate horizontally, a conveyor system for feeding rails through the press and adjustable pressure blocks.

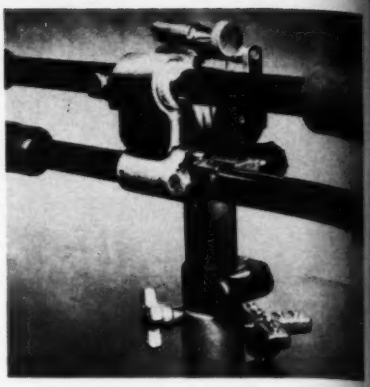
Direction and location of bends in a rail are automatically detected as it moves through the press. When this occurs the conveyor is automatically stopped, the proper ram energized and the rail straightened. The machine is designed automatically to straighten bends up to a radius of 8 ft, but the manufacturer states that bends of longer radius can be straightened by the addition of an outboard sensing device on the exit side of the new rail straightening press. *Hydraulic Press Manufacturing Company, Dept. RTS, Mount Gilead, Ohio.*

Positive tilt control for . . .

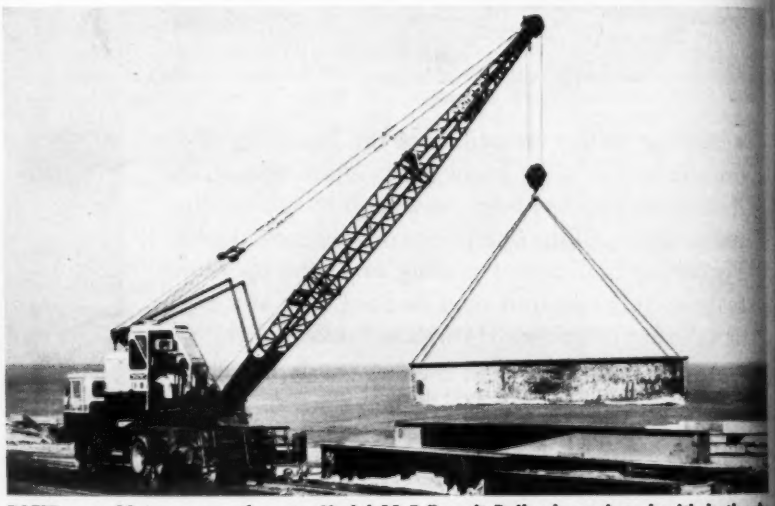
Lining scope

ADDITION of the positive tilt control to the Hayco Model HL Lining Scope is said to enable the operator to set the horizontal crosshair of the telescope on a target and hold it there. Consisting of a vernier adjustment which utilizes hardened worm and bronze-toothed gears, the control is designed to be quickly attached to the top of the instrument. It is constructed from 3/16-in brass with a satin chrome finish. The control is intended to remain attached to the instrument and does not interfere with the normal use of the scope or its placement in the carrying case.

The Model HL Lining Scope consists of two opposite-facing telescopes, one mounted above the other. The top scope is used for sighting ahead, the bottom scope for check sighting to the rear. The scopes are mounted on a telescoping staff which can be raised to a maximum height of 58 in above top of rail from a collapsed height of 26 in. The lining scope clamps to the head of the rail in a position that places the vertical crosshair along the gage of the rail when the telescopes are tilted. The telescopes are six power with achromatic optical systems which are claimed to give an accurate lining distance of up to 600 ft.



A mirror-reflector assembly is also available which consists of a rear-view mirror, demountable visor and red-amber reflector. The assembly can be quickly attached to the staff to provide protection for both the operator and instrument. *The Brice Hayco Company, Dept. RTS, 6710 Northwest Highway, Chicago 31.*



RATED as a 10-ton crane, the new Model 11-B Transit-Railer is equipped with both rubber tires and flanged wheels for operation on either highway or railroad tracks.

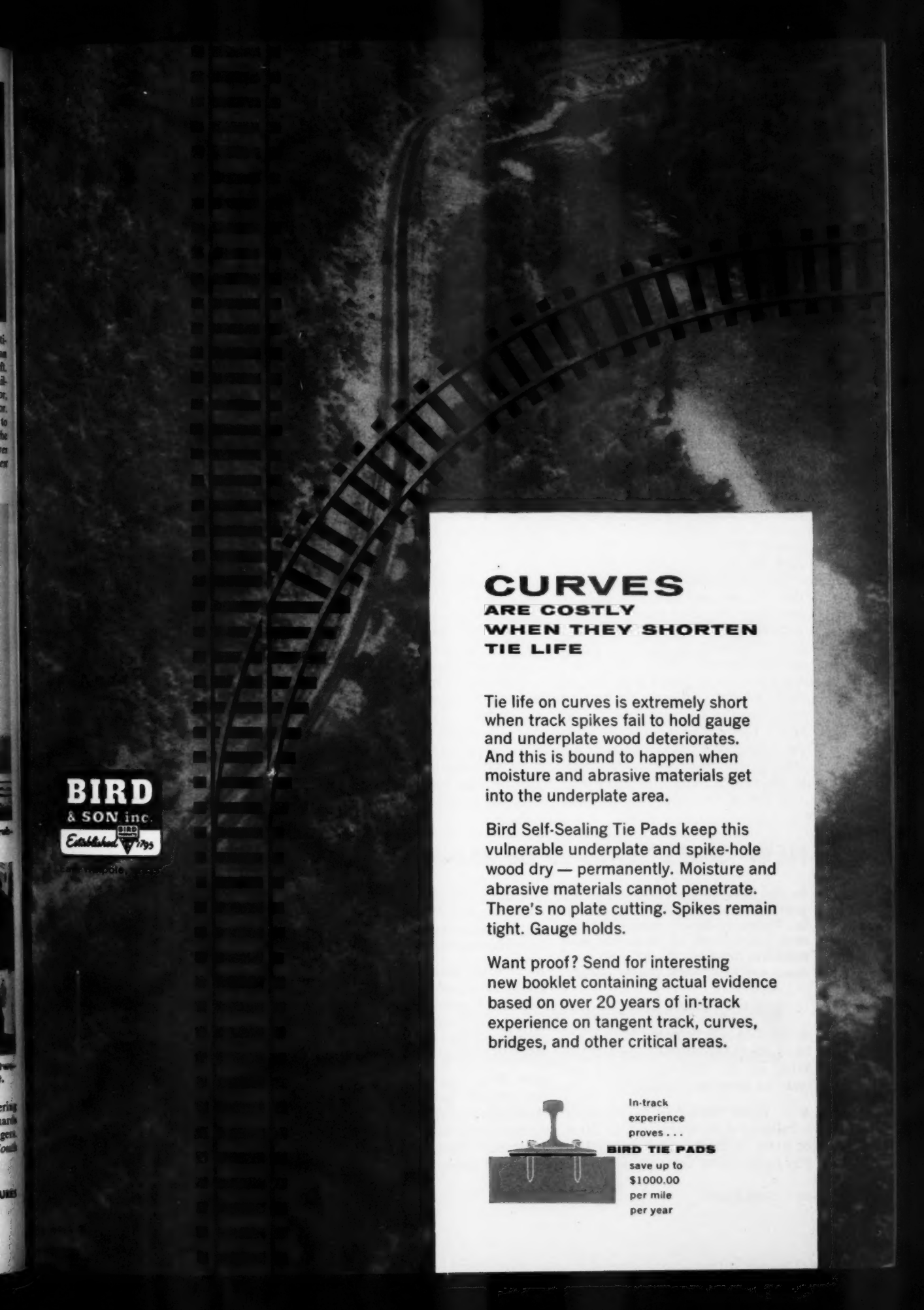
Operates on or off track . . .

Crane-excavator

MOUNTED on a 6x6 carrier equipped with both rubber tires and flanged wheels, the Bucyrus-Erie 11-B Transit Crane has been designated the Model 11-B Transit-Railer and can operate on both highway and railroad tracks. The heavy-duty flanged guide wheels are mounted on the axles, which are attached to telescoping steel legs, by means of roller bearings. The legs are raised or lowered through a two-speed gear-box cranking arrangement.

The Transit-Railer is rated as a 10-ton crane but can also be equipped with a dragline, clamshell, hoe, or shovel. Equipment available for use with the machine includes five-speed, full-reversing transmission plus two-speed auxiliary transmission, hydraulic power steering, remote control of carrier from operator's cab, tire-load indicators, rail clamps (two on each side), steering lockout, front and rear guide-wheel guards and four hydraulically controlled outriggers. *Bucyrus-Erie Company, Dept. RTS, South Milwaukee, Wis.*

FLANGED WHEELS are operated by a two-speed gear-box cranking arrangement.



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Tie life on curves is extremely short when track spikes fail to hold gauge and underplate wood deteriorates. And this is bound to happen when moisture and abrasive materials get into the underplate area.

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WHAT'S THE ANSWER?

Attention to insulated joints

What factors are involved in the proper functioning of insulated joints? Is any regular attention necessary? If so, what?

Use canted plates

By F. A. HESS
Maintenance of Way Engineer
Indiana Harbor Belt
Hammond, Ind.

The first factor is the proper installation of the joints. The rail ends should be cleaned at the joint area. Be sure to remove all burrs and mill scale or rust. Holes in the rail ends should have the sharp edges, which are left by the rail drill, beveled so that minute cracks are removed. This insures against bolt-hole failures. The rail ends should be coated with a hot oil.

Thoroughly clean the joint bars inside and out and also each piece of joint fiber. The joint must be installed with the proper opening for the end post. The end post should be placed between rail ends with the fingers after one bar has been placed in proper position. The second bar is then placed in position to an exact alinement of the bolts. This can be obtained by using the handle of a track wrench or another straight bar. The bolts should be inserted by hand without forcing.

In case of a six-hole joint, the bolts should be tightened in a certain sequence, firmly tapping both bars into place by striking the base of bars with a small sledge throughout the bolt tightening. Tighten bolts as follows, using a 36-in wrench: No. 2-4-6-1-3-5. After the bolts are drawn up to a snug fit, tap each bolt head lightly with a small sledge. Then go over bolts again in the same order to be sure that all bolts have the same tension. Never use a wrench longer than 36 in.

An insulated joint must be supported by good solid ties, properly spaced on clean, well-drained ballast that is well tamped to at least 8 in from the gage side of the joint, well under the joint and to the ends of the ties to prevent pumping at joints and damage to insulation. Battered rail ends should be built up or rails replaced to prevent damage to end post and top fibers.

Some roads use an abrasion plate on insulated joint ties. This is wrong, unless the abrasion plate is canted so that the outside of the joint has the same support on the tie as the inside. If the joint does not have the same support on each side, the rail head and joint will twist outward under traffic. Equal support can be obtained by using a canted abrasion plate under the joint and tie pads under opposite tie plates.

After a joint is installed as outlined above, it should be painted with a good non-conductive paint. Regular attention is necessary for checking the surface, drainage and tension of the bolts. Particular attention must be given to bootleg wires and rail-end overflow. Very little fiber wear will be found on a properly installed and maintained insulated joint.

Periodic inspection

By H. L. LANSING
President
Rail Joint Company
New York

Occasionally special problems arise involving insulated joints which are caused by local track conditions or operations. But these cannot be discussed generally because each one varies with local conditions and requires individual solution. The chief problems are: (1) To secure a reasonable length of service from the insulation; (2) to maintain effective insulating protection for the signal system; (3) to maintain safety of track; and (4) to avoid excessive wear and damage to the rail ends.

To secure all of these results, insu-

NEW QUESTIONS to be answered in October

Do you have an answer to any of the questions listed below? If so, send it in. Payment—based upon substance and length—will be made for each published answer. If you wish your name withheld, we'll gladly comply.

DEADLINE: August 31

- Should track be surfaced both before and after laying new rail? Why? What are the advantages and economies of doing this? Explain.

- 2. When making an inspection of a ballasted-deck timber bridge 20 ft or more in height, what is the best way to determine the condition of the stringers? Explain. To what extent can decay be tolerated in these stringers before complete renewal of the deck becomes necessary?

- 3. When renewing ties it was formerly considered poor practice by some track men to disturb the old tie beds. With modern practices and equipment does this rule still apply? If so, under what conditions? Explain.

- 4. What type and size of truck is best suited for use by work crews doing miscellaneous B&B work? With what accessories or attachments should it be equipped? What type of body should it have? Explain.

- 5. When installing the slat-type of temporary snow fence, how should it be supported and braced? How high above the ground should it be placed and how far from the edge of cut? Explain.

Send answers to:

What's the Answer Editor
Railway Track & Structures
79 West Monroe Street
Chicago 3, Illinois

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6. Mechanically operated dolly wheels and outriggers that cut maintenance.
7. Exclusive BANTAM Rail Threader (patent pending)—threads in ribbon rail between existing tracks faster, smoother. BANTAM positions new rail to gauge in one operation!
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What's the answer? (cont'd)

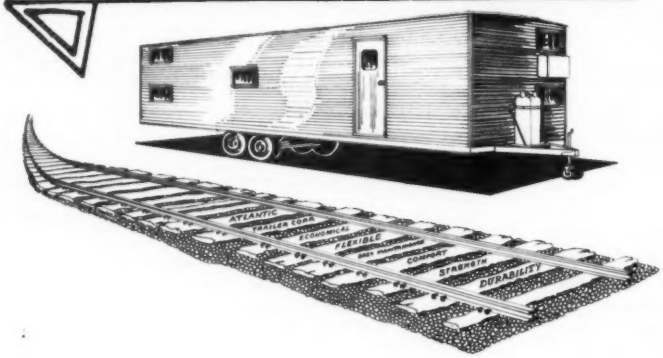
lated joints must be properly and carefully applied and be systematically maintained according to recognized rules of practice. Neglect of these essentials is the cause of the great majority of troubles and complaints involving joints on all railroads. Also, it results in a waste of money, time and labor expense in too-frequent renewals of insulation and in repairs of damage to joints and rails. Much trouble and expense could be avoided by careful supervision of the upkeep of joints.

No insulated joint can be foolproof, though the types currently used are made as nearly so as practicable. The insulated joint must serve the dual purpose of substituting for the all-steel anglebar in supporting and protecting the rail ends, and of providing means for insulating the track circuit. The use of insulating material more compressible and less durable than steel, and the necessity of maintaining a ⅜-in to ½-in gap between rail ends to permit use of an insulating endpost, render the insulated joint more vulnerable to wear than an ordinary joint, and make the impact upon rail end and ties considerably greater. Consequently, it is only reasonable to expect that the insulated joint requires better and more frequent maintenance than the ordinary joint, and yet it too often does not get any greater amount.

With its multiplicity of parts, closely inter-fitting with each other to reduce play and excessive wear, the insulated joint requires careful, accurate installation, with particular attention paid to alternately tightening bolts and mauling the base of the joint while tightening to seat the joint bars properly on base of rails. This requires hand-wrenching and not power-wrenching. There should be special, periodical maintenance attention, and ties should be spaced equally under each rail end, regardless of the method of tie-spacing employed elsewhere.

The types of joint used at present have been developed by the manufacturers from many years of experience with the problems encountered in service, and are designed to function properly under all reasonably fair conditions. The fiber insulation used is the best material available at less than prohibitive cost. Satisfactory results are obtainable if the joint receives the kind of attention and care which the character and usage of the device requires. But, unfortunately, the necessary amount of attention has not often been given in recent years and is now particularly needed to overcome the conditions resulting from increased speeds and shortage of track labor.

ATLANTIC'S NEW "CAMP-CAR"



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Checks current leakage

By J. E. HOUSER
Supervisor Signals
Chesapeake & Ohio
Ashland, Ky.

The ICC definition of an insulated joint is: "A joint in which electrical insulation is provided between adjoining rails."

Insulated joints are used to separate definite lengths of track circuits for signaling, crossing protection, retarder circuits, switch detector circuits, and other special purposes.

Frequent tests and inspections are made by the signal maintainer to see that the fiber insulation is not defective and to see that the ends of the rails are not bridged. In addition to

the visual inspection, an ammeter with 1½-volt dry cell in series is used to check leakage between insulated joint bars and rail. A maximum leakage of 0.020 amperes is permissible. A properly maintained insulated joint will prevent many track-circuit failures.

Insulated joints are also used at gasoline unloading tracks to prevent any foreign current from reaching the tank car unloading area. These joints are used in conjunction with a standard grounding arrangement on this type of track.

The type of insulated joints now being used makes this joint one of the strongest in the track structure when the suporting ties are properly tamped and maintained. Track men make regular inspections to see that these ties are properly maintained.

Tight bolts and ties

By PHILLIP DURAN
Extra Gang Foreman
Southern Pacific
Auburn, Calif.

In the 17 years I have been working with insulated joints, I have always made sure that all of the bolts were kept properly tightened and that the two joint ties and one shoulder tie on each side are kept up and tamped tight.

By keeping all of the bolts tight, the insulation is prevented from coming out.

Keeping the two joint ties and at least the two shoulder ties tamped up keeps the joint level.

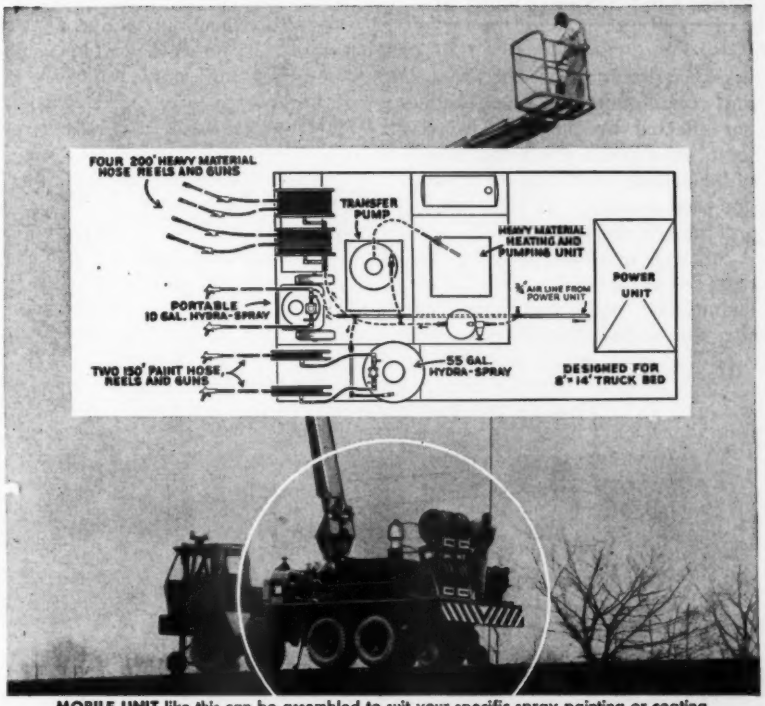
The insulation lasts three times longer, and it doesn't take as much pounding as a low joint does.

A low joint cracks the insulation and ruins it in a short time.

Several factors

By H. D. HAHN
Assistant to Chief Engineer
Chicago & Illinois Midland
Springfield, Ill.

The function of an insulated joint is to prevent the flow of track-circuit current from one rail to another. There are various factors which determine how well an insulated joint will function and how often it will require maintenance attention. The primary factors are the condition of the fiber insulation and seeing that fiber renewals are made before the insulation fails and track-circuit current is allowed to flow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into the adjacent rail. The service life and condition of the fiber insulation are affected by the location of the joint, the support given, the condition of the ballast, the condition of the rails and joint materials, the rail anchorage, and the bolt tension.

Since the insulated joint is generally regarded as the weakest point in track, it should not be located directly opposite another insulated joint unless space limitations or track-circuit design makes such an arrangement necessary. If possible, insulated joints should be staggered from 8 ft to 19½ ft. Staggered joints reduce maintenance and result in a smoother riding track.

Insulated joints should be given maximum support on good sound ties spaced 18 in to 20 in on center with the rail ends centered over the crib. They should be kept in good line and surface since low joints increase the rail-end batter and hasten the breakdown of the fiber insulation. The two ties under the angle bars should have good tie plates and spikes to provide maximum holding power and lessen the vertical pumping of the joint.

It is also desirable to have a clean ballast section free from dirt and vegetation at all insulated joint locations to provide good drainage conditions. Adequate drainage will reduce joint maintenance and increase the life of ties and joint components. Pumping joints are not likely to develop with good drainage, and this condition can quickly lead to a breaking down of the fiber insulation if it is not corrected.

The rail ends should be in good condition at insulated joint locations with little or no rail-end batter. The wide gap necessary at all insulated joints for the installation of the end post results in heavy batter, and it is important that the rail ends be built up before the batter exceeds the recommended limit set by the AREA. Excessive end batter can crush the end post and cause failure of the joint.

Both rails should be well anchored to prevent them from running and breaking down the insulation. Movement of the rail can cause breakage of the track bolts, destruction of the insulation, and failure of the joint to function properly. It is also important to keep the bolts tightened to their proper tension to help prevent track fibers from working out, and to minimize wear on joint materials.

The maintenance of insulated joints is also dependent to some extent on the volume of traffic over the joints, the tonnages carried during any specific period, and severity of the climatic conditions. The periodic inspection and maintenance of these joints by section forces should include inspection of the fiber insulation and renewal of this insulation if required, the spotting up of low joints, tightening of the bolts, checking rail anchorage, and reporting bad conditions of rail-end batter and drainage to the proper authority for further handling.

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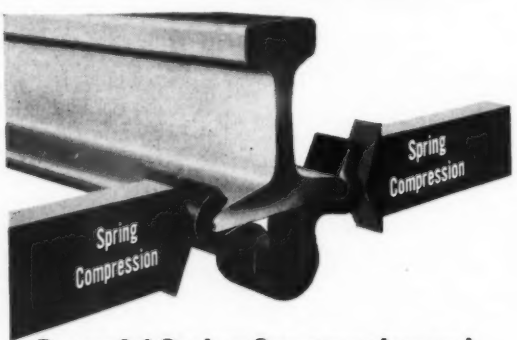

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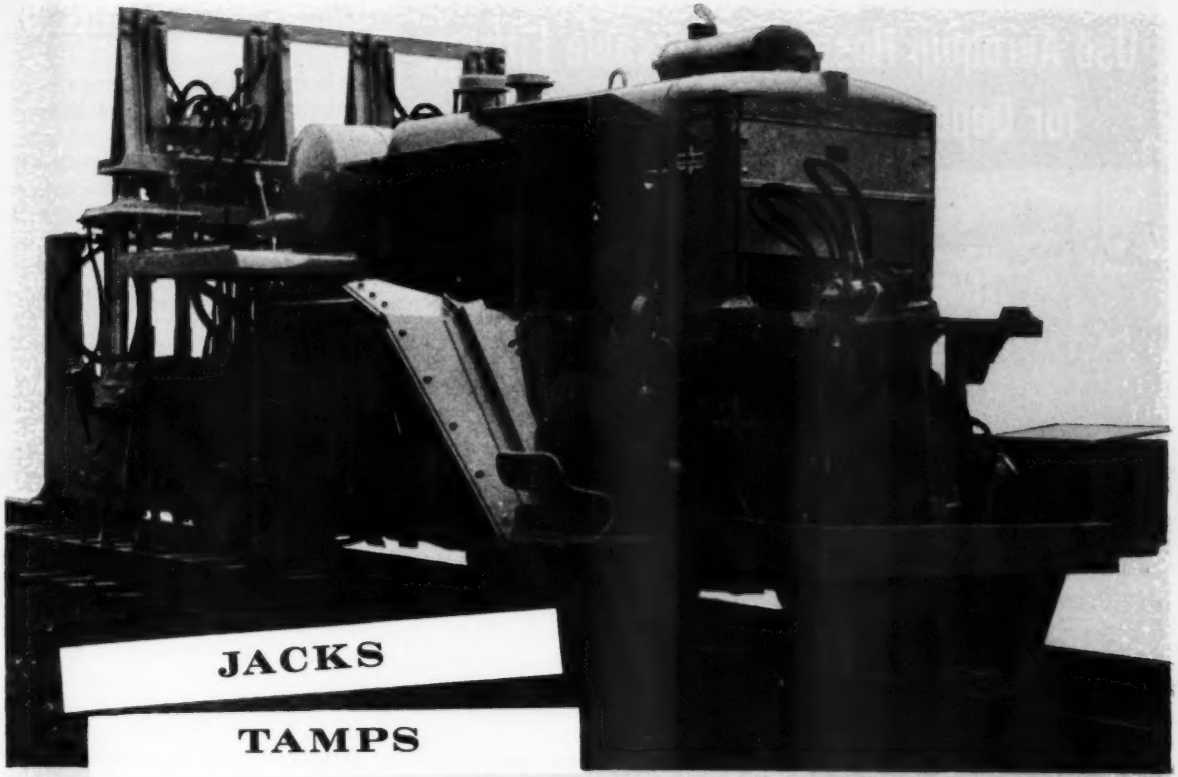
Keep in Compression

By A. L. Essman
Chief Signal Engineer
Burlington Lines
Chicago, Ill.

I am sorry that the scope of the question narrows the reply to some basic functions. With an item such as the insulated joint and its importance



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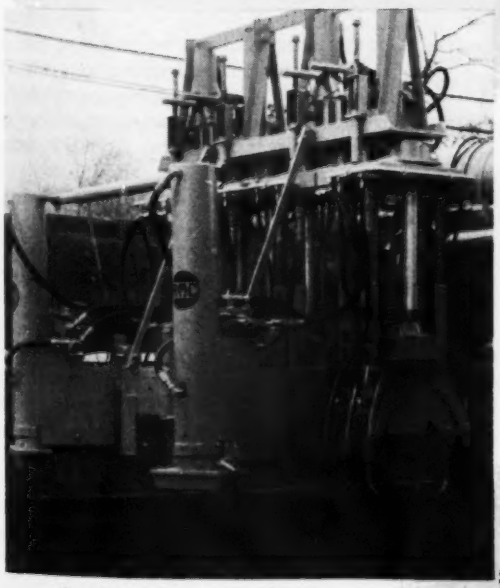

Special tamping head, split four ways, permits jacking and tamping switches

Based on a McWilliams Production Tamper, this new unit **Jacks** track to grade determined by a surfacing device . . . **Tamps** with a 16-tool tamping head . . . **Aligns** the track, using an R.M.C. LineMaster lining head . . . and **Dresses Ballast** with hydraulically-controlled ballast wings. Write for details.

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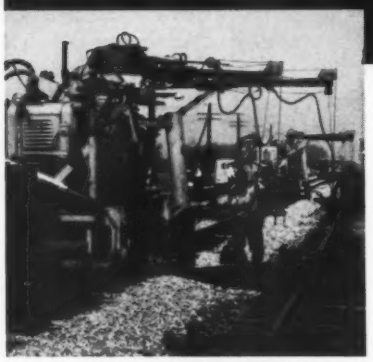
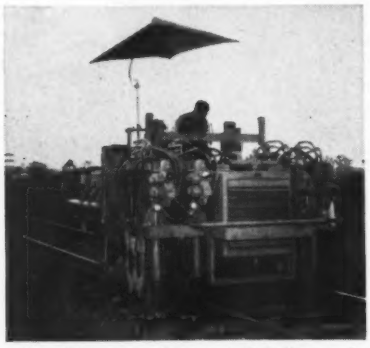


Aeroquip Hose Lines with Reusable Fittings cut replacement costs on all railroad maintenance equipment.



A small inventory of Aeroquip Bulk Hose and Reusable Fittings provide quick replacement fluid lines for this multiple tamper.

Heavy-duty machinery, like this bed-scarifier, features dependable hydraulic lines made from Aeroquip Hose and Reusable Fittings.

It pays to install Aeroquip replacement hose lines on all railroad maintenance equipment for three big reasons.

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Second, Aeroquip Reusable Fittings can be used over and over. You save 20 to 60% on fluid line replacement costs.

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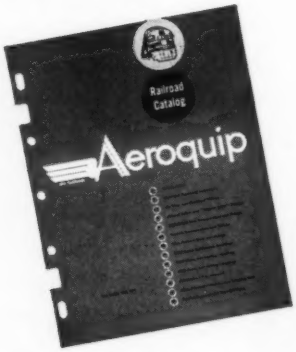
For increased savings and dependability on all fluid lines, specify Aeroquip. See your local Aeroquip factory representative or write us for complete information.



Write for your copy of Aeroquip's Railroad Catalog, No. 401, for information on Aeroquip Hose, Fittings and Self-Sealing Couplings.

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What's the answer? (cont'd)

to both the track structure and to signaling, I think that there should be more said about it.

Basically, this joint is part of the track structure and is a track-department problem. But, when the insulation is applied to it, it also becomes a signal-department problem. With the type of insulated joint that is being used on the American railroads, fiber is the most commonly used insulating material. Because of its composition, it must, of necessity, be kept under compression at all times to make it last and give it life expectancy. Otherwise it absorbs moisture and, when this happens, deterioration takes place.

The success of an insulated joint starts before it is ever installed in the track. The joint bars must be protected in a manner in which rusting will not start on the under side of the bar, for, if it does, there will be an uneven application of pressure on the fibers. The fiber itself must be protected from the weather so as to prevent it from warping and losing its protective coating.

At the time that the insulated joint is applied, extreme care should be exercised in handling the fiber. It should be properly placed so that the insertion of the bolts will not damage the ferrules. Care should be taken to make sure that the bolts are drawn up evenly and, at the same time, the bars should be driven in to provide an even distribution of compression. Then, after the joint has been subjected to traffic for a two-week period, the bolts should be retightened. At this time the bars should again be driven up to aid in the tightening process and, from that time on, the bolts should be kept tight.

Insofar as regular attention being necessary, this is something that should not have to happen. But, of necessity, it is necessary for frequent inspections to be made for assurance that the fibers have not become brittle or cracked and that pieces of it have not started to move out from underneath the bar.

One only has to make a review of the expenditures made for fiber for his railroad to realize how inadequate our present insulated joints are. Coupled with this tremendous fiber replacement is the necessary labor to make the replacement, plus the sacrifice of such labor which could be used more constructively at other places.

With the advances made in the field of plastics and other insulating materials, it is discouraging to see how little has been done insofar as research is concerned to eliminate the use of fiber until just in recent months. To me, the insulated joint employing the use of fiber is far from being satisfactory.

Cleaning paint-spray equipment

How often should paint-spray equipment be cleaned? Describe the best way to do this.

No single answer

By W. L. SHORT
Assistant Engineer
Missouri Pacific
St. Louis, Mo.

Considerable precision equipment may be involved that will require proper service and care if it is to function. Such equipment is generally well designed and will stand up under many hours of rugged use provided the workmen are efficient and fully instructed on how best to use and care for it. Spray-painting equipment must be kept in correct adjustment and free of any foreign matter or dried material. Any restrictions in material flow or atomizing pressure will result in variable spray patterns causing runs, sags, or an uneven film on the coated surface.

Fluid lines, nozzles, pressure tanks, siphon cups, agitating devices, or any part of the equipment that comes in contact with the fluid should be thoroughly cleaned of coating material before this material has time to harden or dry out, or the equipment may be ruined. Such time may range from several minutes to many hours, depending upon the coating material used.

Cleaning is best done by flushing, using a suitable solvent and making certain no solvent is entrapped. Never immerse equipment with moving parts, such as spray guns and pumps, in solvent. Strong solvents may remove necessary lubricants from valve packing and bearings. Do not use caustic

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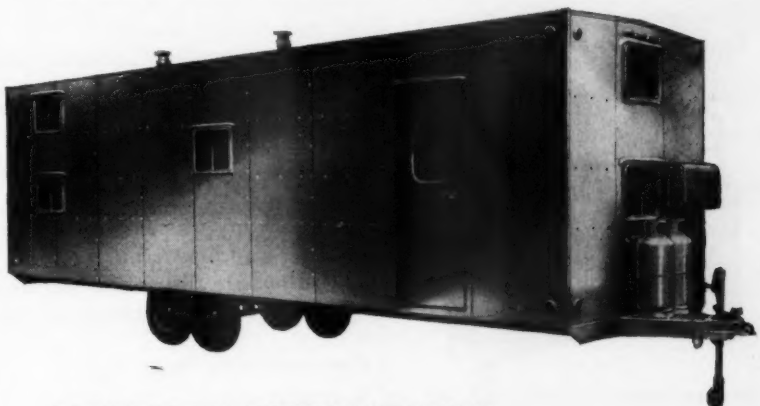

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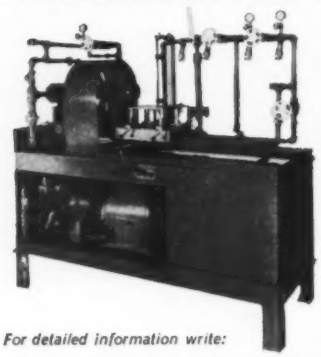

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What's the answer? (cont'd)

solutions since certain metals used in the construction of the equipment may be attacked or corroded.

Most spray-painting equipment will require periodic disassembly for inspection and repair. This is best done by the manufacturer's representative who is familiar with construction details and is properly equipped to make such repairs. A high degree of precision finish is supplied on valves, orifices, fittings, etc., that can be easily damaged or destroyed by an unskilled workman with improper tools.

Prevent drying of paint

By A. E. KVENBERG
Supervisor Building Maintenance
Chicago, Milwaukee, St. Paul & Pacific
Chicago

I am assuming that you have in mind spray equipment used daily throughout the season on certain specific work, such as steel bridge painting, and not equipment used intermittently or for applying various types and colors of material.

We have found that equipment used in regular daily service, spraying commonly used oil-base paints and enamels with similar characteristics, can be operated for several days or a week with nothing more than exterior surface cleaning to keep it in usable condition. It is common practice on our road to thoroughly clean the equipment just before closing camp for the week-end. This is done by carrying out the following procedures:

The pressure tank should be kept full of paint while in operation as much of the time as possible and other measures taken to prevent dried material from building up on the inside of the tank. When the pressure tank is blown down at the end of a day's work, the tank should be immediately refilled to capacity. After the tank has been refilled, a small amount of turpentine should be placed carefully on top of the paint to prevent skinning of the material over night.

The exterior of the paint spray gun should be thoroughly cleaned at the end of the day and the nozzles removed and cleaned to be sure all paint is removed from orifices. Then the gun is reassembled. The nozzle of the gun is placed in a small can of turpentine or other solvent to keep the air orifices open. In doing this, only the head of the gun is immersed, as placing the entire gun into solvent will cause gaskets and seals to deteriorate so that the gun will not operate properly.

In performing a periodical complete cleaning of the equipment, any good solvent, including fuel oil, can be used when equipment has been applying oil-base paint. When used for applying lacquers, enamels or similar products, solvents suitable for that material are required. When cleaning the equipment, all residues from pressure tanks, hoses and guns must be completely removed. Partially cleaned equipment can cause as much difficulty as equipment that has not been cleaned at all.

In following out the above procedures, we have found that many useful hours of spraying time can be obtained where formerly the outfit was shut down sufficiently before quitting time to clean it for the night.

Condensation in computer rooms

Many offices, yardmaster's towers and computer rooms are air-conditioned in summer. What is the best way to prevent or alleviate the formation of condensation on the walls and ceilings of such rooms and the dripping of moisture? Explain.

Five corrective steps

By O. H. TUCKER
General Architect
St. Louis-San Francisco
Springfield, Mo.

We have not experienced such a problem, but if we did, here is how we would go about correcting such a condition:

Visible condensation on walls, ceilings, and windows is usually due to these surfaces chilling the room air below its dew point. The temperature at which condensation appears varies according to the relative humidity in the air (not necessarily the grains of moisture in the air), hence the chilling surface must be colder than the air.

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Provides Uniform, Maximum Holding Power—for any Track—in any Type of Ballast

Lower First Cost—
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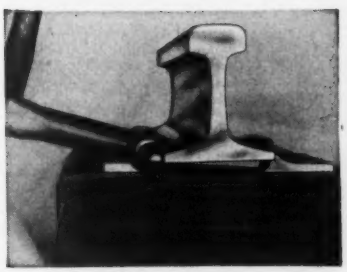
The new Reliance Rail Anchor, made by Eaton Manufacturing Company, is a one-piece, heat-treated, high-carbon, high-manganese spring steel anchor which grips the rail firmly, and provides holding power greater than the resistance of the tie in any type of ballast. Scientific streamlined design requiring less metal, results in lower first cost and effects important savings in transportation, storage, and handling. Due to this lower cost, two-way anchorage can be used with less increase in over-all anchor costs. The Reliance Rail Anchor is effective from the moment it is applied, and every anchor carries its equal share of the load at all times. This uniform anchorage prevents skewing of ties and bunching of ballast.

Send for Illustrated Literature



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What's the answer? (cont'd)

The surface is normally the same temperature as the room air unless it is chilled (or warmed) by outside sources. It can be chilled by the outside temperature being lower than that of the interior, by the presence of cold water pipes behind the surface or by cold-air ductwork. It is probably possible at certain seasons in some climates for the outside temperatures during the night to be sufficiently low as to cool wall and ceiling construction below the dew point of interior air during the day.

Corrective steps would include:

(1) Reducing the coefficient of heat transmission (U factor) of the construction by the installation of vapor-sealed thermal insulation. The thickness of insulation required should be based upon the worst conditions experienced, i.e., differences between outside relative humidity and temperature and inside relative humidity and temperature. A sling psychrometer should be used for this purpose, and readings made during both winter and summer seasons at early morning, noon and at night.

(2) Lowering the temperature of cooling equipment to further dehumidify the interior air, thereby lowering its dew point. Such procedure may depress the duct temperature so low that tempering coils may have to be introduced to reheat the air to a comfortable effective temperature.

(3) Insulating cold-water pipes and cold-air ductwork sufficiently to prevent them from chilling interior surfaces.

(4) Increasing air circulation in the room to enable dehumidified air to wipe the chilled surfaces, and to overcome stratification of the air.

(5) Providing adequate ventilation, especially at times when interior relative humidity is greater than that of the exterior.

Concealed condensation can also be a cause of visible condensation forming on interior surfaces. Most building materials are capable of holding moisture. Sometimes materials will absorb moisture to the saturation point. This is especially true of insulating materials, such as rock wool, when they are not protected with vapor barriers. Frequently, in cold weather, the dew point is within the insulation, causing it to become saturated with moisture.

In uninsulated structures, concealed condensation will occur in such materials as wood, plaster, building boards and others. Aqueous vapor moves from the warmer side of a surface to the colder and, as mentioned, condenses wherever the dew point is located. Hence it is possible for chilled interiors in warm weather to draw concealed condensation to the interior surface.

Such a condition can be overcome by protecting insulation and construction materials by the installation of a vapor barrier on the warm (interior) side, and by controlling interior humidity in cold weather down to a level where it does not condense on window glass.

When visible condensation appears on walls or ceilings, investigation should be made to determine whether the condition exists because of the surfaces chilling the room air or because of concealed condensation. Then appropriate measures should be taken as outlined above.

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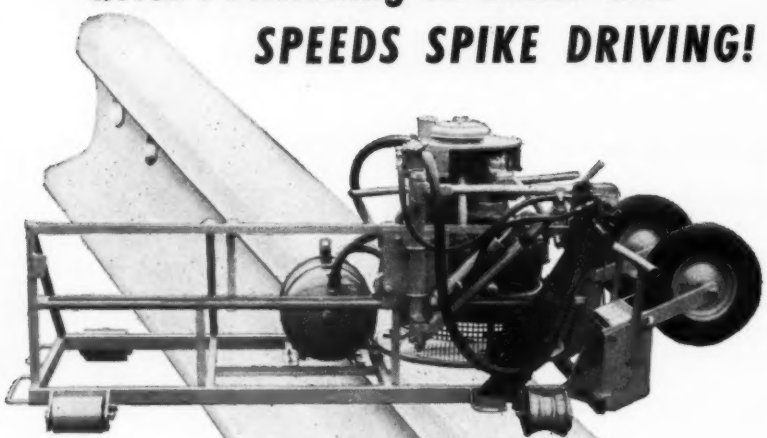

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Stop air infiltration

By E. W. PRENTISS
Engineer Bridges & Buildings
Pennsylvania
Philadelphia, Pa.

Since condensation on walls and ceilings comes principally from moisture-laden air infiltrating through walls

and cracks around windows and doors, alleviation of this condition may be accomplished by using cavity walls or a vapor barrier, together with fixed windows and weather-stripped doors. The condensation occurs when the moisture-laden air comes in contact with the cool walls and ceilings of the air-conditioned room.

If it is impractical or too costly to apply the above mentioned corrective measures, we believe the condition would be improved by installing a dehumidifier in the room.

Hauling crossties in trucks

When hauling and distributing crossties by truck, should the ties be loaded crosswise or lengthwise with the truck bed? Why?

Load crosswise

By J. H. BECKER
Section Foreman (Ret.)
St. Louis-San Francisco
Festus, Mo.

When loading ties on a truck for distribution, I would say that, where you have enough room on one side of the track to unload them, the best thing would be to load them crosswise. This is especially true where you have a long stretch of straight track as all ties are adzed and bored with a line end. By loading them this way they will come off of the truck with the line ends on the right side and will not have to be turned. This loading and unloading will save a lot of extra work at the time of inserting them.

Where you have a lot of curves, as I had on the Frisco, I do not think it makes too much difference which way they are loaded on the truck. But, because of the larger number of miles of straight track, I think the best way to load ties on trucks would be crosswise.

Biographical briefs (cont'd)

(Continued from page 10)

born at Reedley, Cal., and graduated from the Missouri School of Mines in 1950. Mr. Schmidt entered the student training pro-

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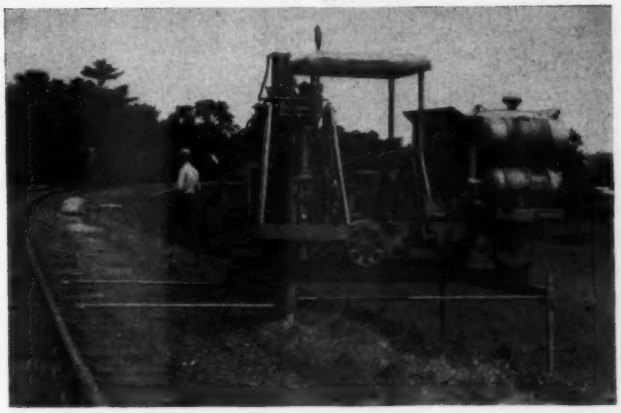
Patent Applied For



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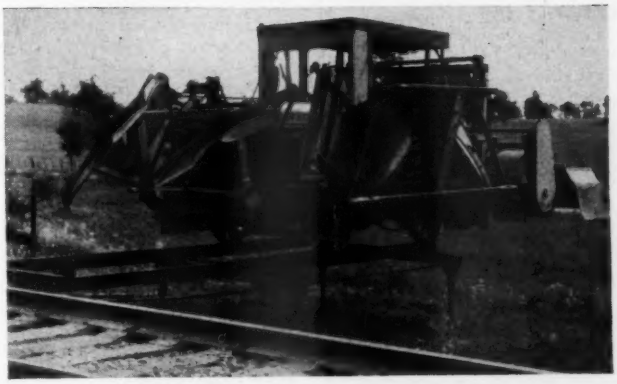

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Biographical briefs (cont'd)

gram of the Frisco in that year, serving at various locations until he was promoted to assistant general forman bridges and buildings in 1952. He was further promoted to assistant roadmaster in 1954, roadmaster in 1955 and assistant division engineer in 1957. Mr. Schmidt was serving in that capacity at Chaffee, Mo., at the time of his recent promotion.

William C. Borchert, 66, who recently retired as division engineer on the Louisiana & Arkansas at Shreveport, La. (*RT&S,* Feb., p. 10), was born at Kyle, Tex., and graduated from Texas Agricultural and Mechanical College in 1913. He commenced his railroad career in 1913 with the Southern Pacific Lines in Texas and Louisiana as a rodman at Ennis, Tex., subsequently serving as draftsman, assistant engineer and division engineer. In 1919 he joined the Missouri-Kansas-Texas as an assistant engineer at Dallas, Tex. He was later promoted to general foreman, roadmaster and district engineer. In 1923 Mr. Borchert was appointed chief engineer of the Louisiana Railway & Navigation Co. of Texas and its successor the Louisiana, Arkansas & Texas. He was appointed division engineer of the L&A at Shreveport in 1939.

Albert F. Langmeyer, 33, who was recently promoted to assistant general building inspector of the Illinois Central at Chicago (*RT&S,* Feb., p. 10), was born at Chicago and graduated from Chicago Technical College in 1951 with a Bachelor of Architecture degree. He entered the service of the IC in 1947 as a draftsman in the building department. Upon graduation from college he was appointed junior engineering aide in the building department. Mr. Langmeyer was promoted to designer in 1953, the position he held at the time of his recent promotion.

Howard W. Lane, 56, who was recently promoted to supervisor, materials, records and standards, of the Elgin, Joliet & Eastern at Joliet, Ill. (*RT&S,* Mar., p. 10), was born at Richmond, Ind. He entered the service of the EJ&E in 1923 as a track laborer at Warrenhurst, Ill. Mr. Lane was promoted to track foreman there in 1925, being transferred to Dyer, Ind., in 1930,

J. B. Schaub
Illinois Central

John A. Ferguson
Athey Products

extra gang foreman, system, in 1941, assistant track supervisor at Joliet in 1946, track supervisor there the following year and supervisor bridges and buildings, also at Joliet, in 1951. He was further promoted to roadmaster there in 1953, the position he held at the time of his recent promotion.

Edwin T. Lurcott, 31, who was recently promoted to supervisor structures on the Pennsylvania at Columbus, Ohio (*RT&S,* Mar., p. 10), was born at Elizabeth, N. J., and gradauted from Syracuse University in 1952. Mr. Lurcott entered the service of the PRR in 1952 as a junior engineer at Philadelphia, Pa. He was promoted to assistant supervisor structures at Indianapolis, Ind., in 1954, the position he held at the time of his recent promotion.

William H. Yost, Jr., 32, who was recently promoted to roadmaster on the Norfolk & Western at Bluefield, W. Va. (*RT&S,* Mar., p. 10), was born at Bluefield and received his higher education at the Virginia Polytechnic Institute and Bluefield College, also taking a correspondence course in diesel and internal combustion engines. Mr. Yost entered the service of the N&W in 1944 working summers. He was appointed roadway machine repairman at Norfolk, Va., in 1953 and inspector, office of manager of roadway maintenance, at Roanoke, Va., in January 1955. In July of that year he was promoted to assistant supervisor bridges and building at Bluefield. The following year he was further promoted to assistant roadmaster there. Mr. Yost was serving in that capacity at Crewe, Va., at the time of his recent promotion.

J. Benton Schaub, 70, who recently re tired as engineer of buildings of the Illin Central at Chicago (*RT&S,* Feb., p. 1 was born at Mount Airy, N.C., and gra uated from Valparaiso University in 19 with a degree in civil engineering. M Schaub also studied at Chicago Technic College and the School of Architectu of the Chicago Art Institute. He co menced his railroad career in 1910 a station assistant and telegraph opera on the Southern. After graduation fr college he served as a draftsman in t bridge department of both the Burlingt and Milwaukee at Chicago. Mr. Scha joined the IC in 1917 as a draftsman Chicago. He was promoted to squad lead in 1919, chief draftsman in 1927 and sitant engineer of buildings in 1943. 1956 he was advanced to the position engineer of buildings.

Supply trade news

ATHEY PRODUCTS CORPORATION—John A. Ferguson has been appointed sales manag of **Athey Products Corporation,** Chicag according to an announcement by **Ben Lease,** president. Mr. Ferguson has serv in selling and sales management capacit with a number of railway supply firms, in cluding The Matisa Equipment Corpor tion, Stran-Steel Corporation and Pettibo Mulliken Corporation. His most recent po sition was that of sales manager of th Roto-Pak Sales Corporation, Chicago. In his new capacity he will be in charge o sales of Athey equipment to the railroad heavy construction and mining markets.

KOPPERS COMPANY, INC.—Robert H. Devine, assistant to division general manag of the Wood Preserving Division, has bee promoted to assistant vice president, ac cording to an announcement by **Dougl Grymes, Jr.,** vice president and division gen eral manager. Mr. Devine will also retai his former title.

NELSON STUD WELDING DIVISION—Alex R. Oleair has been appointed product sale manager for steel mills and the transport

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- Piston varnish deposits were greatly reduced, rings stayed clean and free acting – extending engine life.
- Anti-wear additive gave greater protection to cam shafts, valve lifters, bearings and gears.

Essolube HDX is another new product developed by Esso Research to reduce railroad maintenance costs. Specify Essolube HDX for maintenance-of-way and other equipment using small, high-speed engines. For information, write: Esso Standard, Division of Humble Oil & Refining Company, 15 W. 51st St., New York 19, N.Y.

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Supply trade news (cont'd)

F. O. Johnson, Jr.
CF&I

Harold L. Robinson
Racine

tion industry, according to an announcement by **Richard E. McGinnis,** vice president-sales of **Gregory Industries, Inc.,** of which Nelson Stud Welding is a division. Mr. Oleair will report directly to **Robert C. Friedly** who has been appointed general sales manager for products of all divisions of Gregory Industries.

COLORADO FUEL & IRON CORP.—Floyd O. Johnson, Jr., railroad sales engineer, Denver, Colo., has been promoted to assistant to general manager, railroad sales, with headquarters at Denver, according to an announcement by **W. S. Boyce,** general manager of railroad sales.

Mr. Johnson was born at Greeley, Colo., and graduated from Iowa State University in 1949 with a Bachelor of Science degree in civil engineering. After graduation he entered the service of the Pennsylvania as a junior engineer, subsequently serving in various capacities in the engineering and maintenance departments. Mr. Johnson was appointed railroad sales engineer for CF&I on December 1, 1953.

PORTLAND CEMENT ASSOCIATION—George K. McCord has been appointed Wisconsin district engineer with headquarters at Milwaukee, succeeding **W. D. Kimmel** who retired on June 1 after more than 25 years of service with the association.

RACINE HYDRAULICS & MACHINERY, INC.—Russ A. Henke has been appointed director of research in connection with expansion of this company's research and development program. Prior to joining Racine, Mr. Henke was head of the consulting firm of Russ Henke Associates, Elm Grove, Wis. Racine also announced that all research for its six plants in Wisconsin and Ohio eventually will be concentrated at Racine, Wis. A building to house these functions is now under construction.

Another development in this company is the creation of a mobile hydraulic division, according to an announcement by **John E. Erskine,** president. For many years, the Racine firm has been producing mobile components along with its lines of industrial hydraulic equipment. The formation of a separate mobile division at this time is prompted, according to the announcement, by accelerating mobile hydraulic sales and a strong trend toward the use of precision hydraulic components and circuitry in mobile applications.

Harold L. Robinson, formerly with Vickers, Inc., Detroit, is sales manager of the new division. **Clare Hellenberg,** an engineering specialist in mobile hydraulics, has been appointed chief engineer of the new division. Other staff members include **Eugene Crossland,** application engineer, and **Edward Brannon,** product engineer.

RAIL JOINT COMPANY—H. L. Emerson, district sales manager at St. Louis, Mo., retired recently, according to an announcement by **W. E. Gadd,** vice president of the company, which is a division of Poor & Co. Mr. Gadd also announced that, effective June 15, the Rail Joint Company will be represented in St. Louis by **Will H. Reaves, Inc.,** with headquarters at 1084 Arcade Bldg., St. Louis 1.

Association news

American Railway Engineering Association

Two standing committees have scheduled meetings to be held in July. They are:

Iron and Steel Structures, July 27-28, AAR Research Center, Chicago; Economics of Railway Labor, July 11-12, Montreal, Que., including field inspection of facilities and work methods of the Canadian National and Canadian Pacific.

A meeting of the Board of Direction will be held on August 8 at the AAR Research Center, Chicago. Among other things, the board will consider plans for the 1961 convention to be held at Chicago.

Roadmasters' Association

The Executive Committee of this association will meet at the Engineers' Club, Chicago, on July 11 to discuss final plans for the convention to be held on September 19-21 at the Conrad Hilton Hotel, Chicago, in conjunction with the annual meeting of the Bridge & Building Association. Another important item on the agenda will be the reading of at least most of the committee reports to be presented at the convention. These include reports of special subject committees as well as those of the association's three standing committees. The meeting will be held under the direction of President S. E. Tracy.

Bridge & Building Association

Final details of the coming annual convention were discussed at a meeting of the Executive Committee of the Bridge & Building Association, held at the Engineers' Club, Chicago, on June 20. The meeting was held under the direction of B. M. Stephens, president. The annual meeting will be held on September 19-21 at the Conrad Hilton Hotel, Chicago, concurrently with the convention of the Roadmasters' Association.

Other business conducted at the meeting included the reading and review of reports presented by the association's special subjects committees for presentation at the annual meeting. Consensus of the members was that the association can look forward to one of the most interesting and constructive conventions held in years.

Deck—4' x 5' weatherproof plywood and corrugated steel construction.

CONSERVE THE ENERGY OF YOUR MOBILE TRACK GANGS WITH THIS . . .

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TRACK TOOL TRANSPORTER

This handy, light-weight push car carries tools to the job site from the nearest crossing or other point where truck or bus must stop. *Men arrive fresh and ready for work having been spared the laborious job of toting hundreds of pounds of tools and equipment—saves time—and muscles—for the important job!*

Rolls easily on anti-friction bearings even when fully loaded.

Handle can be inserted on either side for pushing in either direction.

Weighs only 160 lbs.—yet will carry a thousand pounds of tools or materials! This is due to the novel steel-reinforced weather-proof plywood deck construction. *Light—but amazingly strong!* Can be set up or dismantled in *less than a minute* for easy loading into a truck, bus or motor car.

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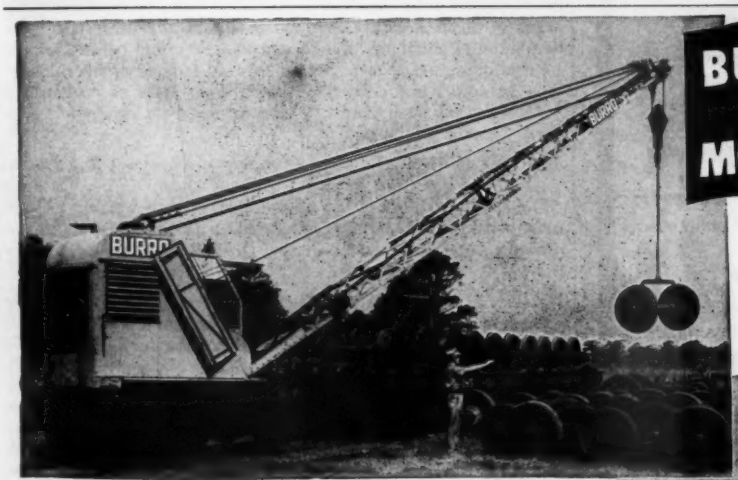

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This job—handling wheel assemblies in and out of storage—won't support high costs. That's why a Burro is doing the job.

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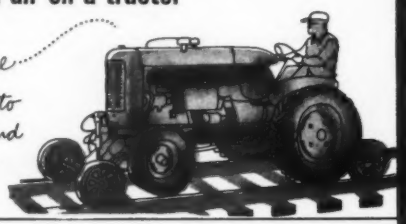
1 rugged Schramm unit gives you compressed air on a tractor

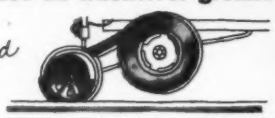
125 cfm of air here

unit drives to any job... and along with the job



2 Pneumatractor rides on track... or ground

note retractable flanged rail car wheels



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3 powerful compressor speeds work

operates up to 12 tie-tampers and other air tools

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towing (no more trucks, crews tied up)

pushing (and the cost each time they push)

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5 yet a Schramm Pneumatractor costs little more than a portable compressor alone!

cost competitive portable 125 . . . . . $4,750

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Less than $100 for self-propulsion!

no wonder railroads are using fleets of Pneumatractors

Get the full story. Write for Bulletin RRP-56 today.

Schramm PNEUMATRACTORS

Self-propelled Air Compressors

732 North Garfield Ave., West Chester, Pa.

Helps from Manufacturers

The following compilation of literature—including pamphlets and data sheets—is offered free to railroad men by manufacturers to the railroad industry. To receive the desired information, write direct to the manufacturer.

•

CAR RETARDER. The Racor mechanical car retarder is described and illustrated in a four-page folder. The folder describes the operating features of the new retarder and points out the advantages of its use in yards, piggyback loading docks, car cleaning tracks, bulk cargo handling facilities and other locations. Drawings show the unit installed in track and the component parts of the spring assembly. (Write: *American Brake Shoe Company, Dept. A-RTS, 530 Fifth Ave., New York 36.)*

CRAWLER TRACTORS. The advantages of using Caterpillar D9 and D8 crawler tractors are given in a new 8-page, 2-color booklet. Entitled "The Men Who Know," the booklet describes the operation of the machines by a number of contractors and includes a testimonial from each contractor or his supervisor, foreman or operator. On-the-job photographs show the machines doing a variety of earthmoving jobs. The features and specifications of the tractors are included. (Write: *Caterpillar Tractor Company, Dept. RTS, Peoria, Ill.)*

GROUNDS MAINTENANCE EQUIPMENT. A new type of catalog is available which describes the industrial uses of Gravely equipment for grounds maintenance. Entitled "How to Cut Costs with Gravely Power for Grounds Maintenance," the 16-page catalog describes and illustrates the units, with emphasis on mowing, snow removal and ground preparation. Action pictures are used to show the equipment in use at different occupations. (Write: *Gravely Tractors, Dept. RTS, Dunbar, W. Va.)*

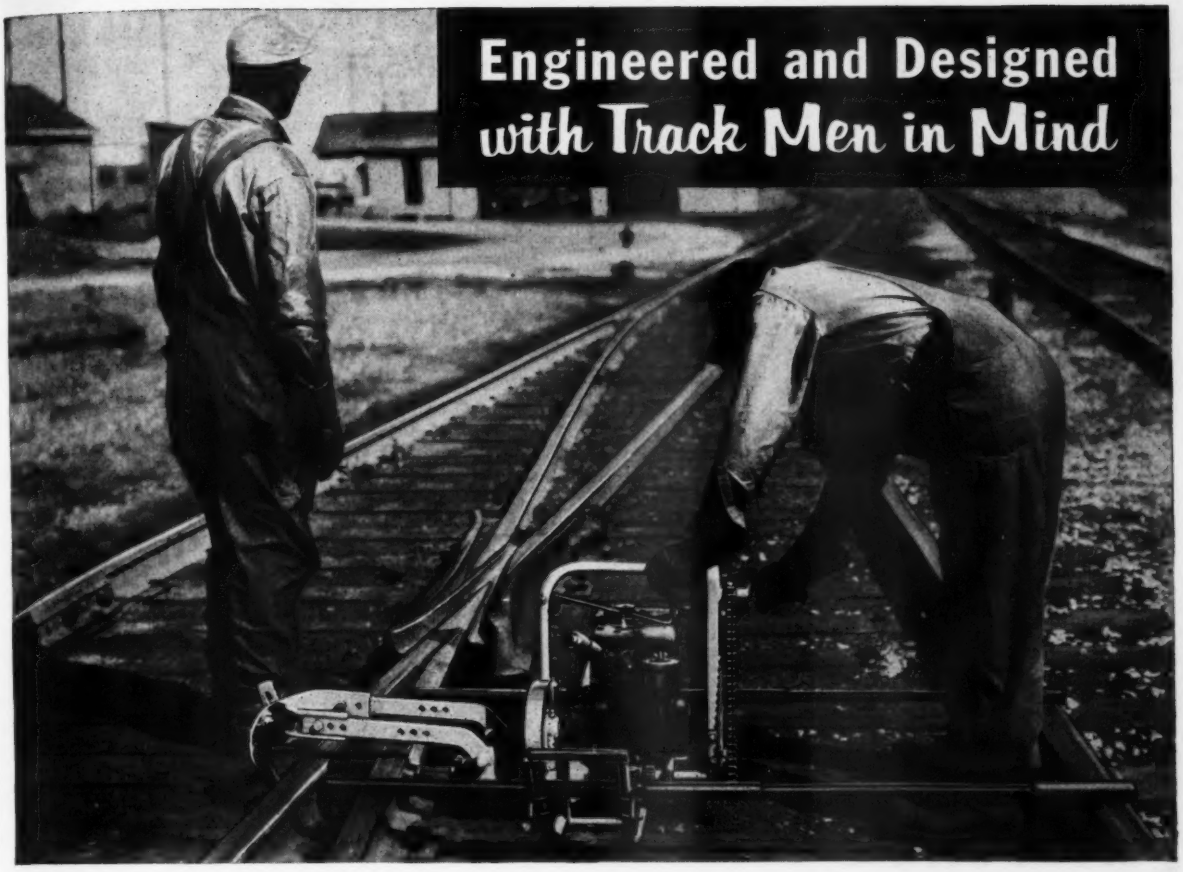
STEEL BUILDINGS. A new booklet, entitled "7 Money Saving Ideas from Stran-Steel," is available which describes the advantages of Stran-Steel pre-engineered buildings. The booklet points out some of the items that should be considered before the plans of a building are drawn. Items covered include architectural design in color, low cost, floor plans, heat, light, ventilation, fire safety, and purchase plan. (Write: *Stran-Steel Corporation, Dept. RTS, Detroit 29, Mich.)*

IMPACT WRENCH. The features of the new I-R Size 808 Impactool are described in an information sheet. Designated Form 5279, it also points out the advantages of the new tool. Included are specifications and lists of standard and optional equipment. (Write: *Ingersoll-Rand Company, Dept. RTS, 11 Broadway, New York 4)*

EXTENSION LADDER. The "Bally-Hi" two-stage aluminum extension ladder, mounted on a wheeled frame with collapsible outriggers, is described and illustrated in a new circular. The safety features of the Model 159-1 are described, including pulpit-type collapsible guard rail at top of ladder, flat rung for standing near top, locking device for anchoring frame to ground, screw-type leveling jack and guard rail along entire length. Three drawings show the construction and dimensions of the wheeled frame at the base of the ladder. (Write: *Ballymore Company, Dept. RTS, West Chester, Pa.)*

SELF-DRILLING ANCHORS. A loose-leaf page is available which describes and illustrates the "Hi" line of self-drilling anchors. The features of the anchors are pointed out and the different sizes of each type, including flush, snap-off and tie-wire, are listed. Directions for the proper method of hand or power installation are included. (Write: *Holub Industries, Inc., Dept. RTS, Sycamore, Ill.)*

CHECK VALVES. Golden-Anderson Double Cushioned check valves are described in a new four-page bulletin. Cut-away drawings are used to illustrate the features of the valves, including the prevention of damaging hammer and shock due to back surge. Included in the bulletin are dimensions of the valves, parts list, recommended applications, specifications and a general list of materials. (Write: *Golden-Anderson Valve Specialty Company, 1246 Ridge Ave., Pittsburgh 33, Pa.)*



WESTERN FORMERLY BUDA Power Track Drill

Here is a vital piece of equipment in keeping track modernization, expansion and maintenance programs in high gear—the Model P power track drill that has ALL the features essential to economical operation.

EASILY SET UP...and ACCURATE. Can be located from top of rail (with optional telescopic support and locater rods) or positioned on ties and ballast (with long overclutch and adjustable rail guide). No change in set up necessary while working on same size rail.

COMPACT and PORTABLE. Weighs only 130 pounds. Can be started, operated and slid along the rail *by one man.* Easily carried overland by two men.

DEPENDABLE. Gives all-weather, long-life service. Powered by easy-starting 1¾ h.p., 4-cycle Briggs & Stratton air-cooled gas engine. Equipped with Timken roller thrust bearing. Versatile spindle sleeve handles all flat drills from 7/16" to 1 3/16".

SAFE. Can be released and removed from track within 10 seconds . . . no stopping and backing off.

CONTROLLED FEED. Avoids broken and prematurely dulled drills. Sensitive crank-chain mechanism allows operator to vary the thrust accurately according to the hardness of the rail and sharpness of the drill.

FAST. Drills 1⅛" hole in 90 lb. rail in 30 seconds . . . in 155 lb. rail in less than 90 seconds.

HYDUTY-PAULUS MANUAL TRACK DRILL

A track maintainer's tool that every section house should have. Special safety and adjustment features assure precision drilling plus instant emergency detachment.

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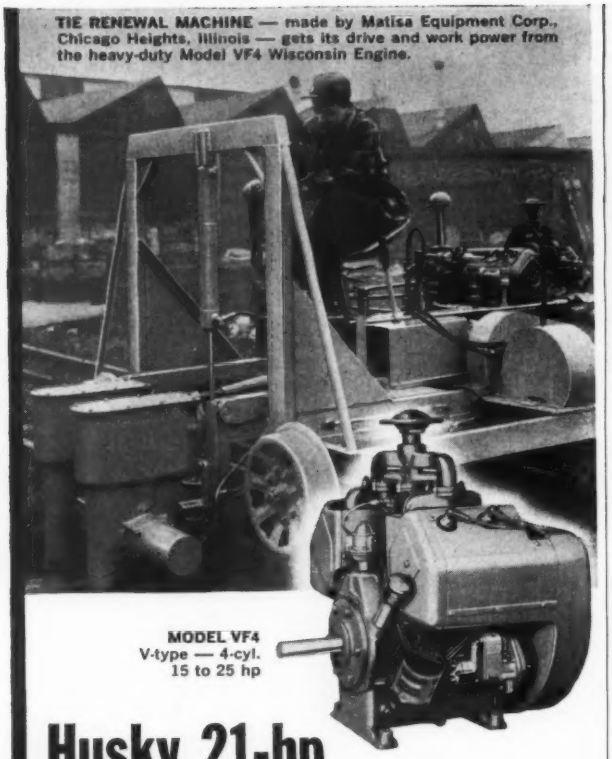
One of a series of ads featuring new WESTERN products formerly supplied by BUDA



TIE RENEWAL MACHINE — made by Matisa Equipment Corp., Chicago Heights, Illinois — gets its drive and work power from the heavy-duty Model VF4 Wisconsin Engine.

MODEL VF4
V-type — 4-cyl.
15 to 25 hp

Husky 21-hp WISCONSIN ENGINE

powers self-propelled tie renewer...

Tie replacement is a snap these days. You can roll 'em out and roll 'em in with fingertip ease — if you use a Wisconsin-powered tie renewal machine like the self-propelled Matisa unit shown above.

The rugged Wisconsin provides the time-saving drive that moves the machine from job to job. It supplies the work-saving muscle for the knurled rollers for fast, easy handling of ties. The result: tie replacement at less than half the cost of older methods.

The Wisconsin is precision-fitted to stand up under the heaviest service. And its load-lugging power prevents stalling when handling stubborn ties.

Your air-cooled Wisconsin starts fast and easy whether it's 20° F. below or 140° F. above zero. You get the most power service with the least care because there's nothing to dry up or freeze up. You don't need water or anti-freeze. And there are no radiators, water pumps, fan belts, and other water-cooling parts to fuss with — or to run up costs.

Mechanize your m/w operations with Wisconsin Engines, 3 to 56 hp. Electric starting available for all models. Get Bulletin S-251. Write Dept. R-20.

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World's Largest Builders of Heavy-Duty Air-Cooled Engines

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FAST LOAD HAULER!

NOLAN TOOL and SUPPLY CAR

You can load this handy, easy-rolling hand car with up to 2000 lbs. of tools, ties, rails and supplies . . . and transport them quickly and safely from truck or bus to the job. Accepted as the standard railway tool and supply car by the leaders!

All tubular high-carbon steel construction for trouble-free heavy-duty service. Car breaks conveniently in the center into two sections for easy handling and transportation. Each section can be used as a truck seat.

The deck is heavy mesh-expanded steel. Removable handle can be used at either end. Ball bearing cast steel wheels.

Platform Size 48" x 45"
Height Above Rail 8"
Weight 140 lbs. complete

Write for complete illustrated literature and prices. FREE complete catalog of entire NOLAN railway supply line.

NOLAN TRACK DOLLY

The fast, safe, easy way to transport heavy rails, ties, supplies, tools, rerailers, etc. Tubular high-carbon steel construction. The deck is heavy mesh-expanded steel. Removable handle.

STANDARD DOLLY

Length	Width	Rail	Weight
50½ in.	15½ in.	6⅝ in.	88 lbs.

INSPECTOR'S DOLLY

36 in.	14 in.	6 in.	60 lbs.

THE NOLAN COMPANY, 166 Pennsylvania St., Bowerston, Ohio

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DOUBLE-THICK SEAL

. . . which gives an instantaneous, perfect and lasting bond to the tie . . . while a Special Binder gives maximum adhesion of the asphalt seal to the pad.

FABCO Super Seal TIE PADS

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FABCO TIE PADS have the proper resiliency to cushion shock. They withstand all conditions encountered in service. Their Quality and Durability have been thoroughly proven by over 15 years service in track. Long Pad Life means Low Pad Cost.

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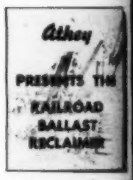

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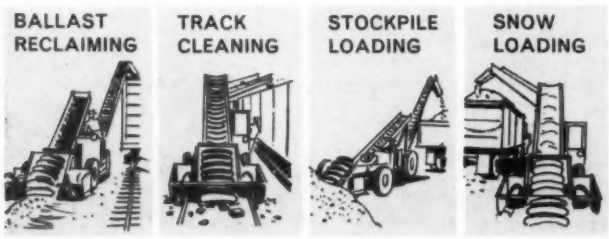

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A quick-change artist, the 188 converts to a Track Cleaner, a top production Stockpile Loader and a Snow Loader. By making simple changes in the machine you keep the 188 working full time all the time cutting costs on a variety of loading jobs.

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